

=> fil reg

FILE 'REGISTRY' ENTERED AT 18:12:30 ON 15 DEC 2006  
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(FILE 'HOME' ENTERED AT 15:12:01 ON 15 DEC 2006)

FILE 'HCAPLUS' ENTERED AT 15:12:33 ON 15 DEC 2006

L1 1 SEA US2004137332/PN

FILE 'REGISTRY' ENTERED AT 15:13:27 ON 15 DEC 2006

L2 15 SEA (463-79-6/BI OR 1072-53-3/BI OR 108-86-1/BI OR

FILE 'REGISTRY' ENTERED AT 15:20:45 ON 15 DEC 2006

L3 STR

L4 SCR 2043 OR 1839

FILE 'LREGISTRY' ENTERED AT 15:26:03 ON 15 DEC 2006

L5 134 SEA (C(L)X)/ELS (L) 2/ELC.SUB

L6 1285 SEA (C(L)H(L)X)/ELS (L) 3/ELC.SUB

FILE 'REGISTRY' ENTERED AT 15:28:05 ON 15 DEC 2006

L7 492 SEA 46.150.18/RID AND ((C(L)X)/ELS (L) 2/ELC.SUB)

L8 41192 SEA 46.150.18/RID AND ((C(L)H(L)X)/ELS (L) 3/ELC.SUB)

L9 0 SEA L2 AND L7

L10 4 SEA L2 AND L8

FILE 'LREGISTRY' ENTERED AT 15:55:31 ON 15 DEC 2006

L11 1199 SEA 46.150.18/RID NOT (A1 OR A2 OR T1 OR T2 OR T3 OR B2  
OR LNTH OR ACTN OR A3 OR A4 OR A5 OR A6 OR A8)/PG

L12 1116 SEA L11 NOT PMS/CI

L13 596 SEA L12 AND X/ELS AND C/ELS

FILE 'REGISTRY' ENTERED AT 16:01:19 ON 15 DEC 2006

L14 50094 SEA L12 AND X/ELS AND C/ELS

SAV TEMP L14 WEI638X/A

L15 STR L3

L16 50 SEA SSS SAM L15 NOT L4

L17 55188 SEA SSS FUL L15 NOT L4

SAV L17 TEMP WEI638A/A

L18 4 SEA L2 AND L14

L19 1 SEA L2 AND L17

L20 STR L15

L21 1 SEA "1,3,2-DIOXATHIOLANE, 2,2-DIOXIDE"/CN

L22 50 SEA SUB=L17 SSS SAM L20

L23 10904 SEA SUB=L17 SSS FUL L20

SAV L23 TEMP WEI638S1/A

L24 STR L15

L25 50 SEA SUB=L17 SSS SAM L24

L26 49101 SEA SUB=L17 SSS FUL L24

SAV L26 TEMP WEI638S2/A

L27 STR L20

L28 50 SEA SUB=L17 SSS SAM L27

L29 10209 SEA SUB=L17 SSS FUL L27

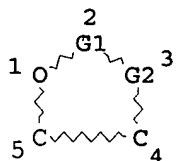
SAV L29 TEMP WEI638S3/A

FILE 'HCAPLUS' ENTERED AT 17:36:04 ON 15 DEC 2006

L30 126 SEA L21  
 L31 QUE ELECTROLY?  
 L32 17 SEA L21 (L) L31  
 L33 59592 SEA L26  
 L34 6448 SEA L26 (L) L31  
 L35 26694 SEA L29  
 L36 6266 SEA L29 (L) L31  
 L37 188563 SEA L14  
 L38 442 SEA L14 (L) L31  
 L39 119 SEA L38 AND (L32 OR L34 OR L36)  
 L40 2937 SEA L37 AND (L30 OR L33 OR L35)  
 L41 10 SEA L40 AND L30  
 L42 2 SEA L41 AND L31  
 L43 QUE SOLVENT#  
 L44 25 SEA L30 AND L43  
 L45 12 SEA L44 AND L31  
 L46 980 SEA L40 AND L35  
 L47 152 SEA L46 AND L31  
 L48 100 SEA L47 AND L43  
 L49 85 SEA L48 AND L36  
 L50 QUE ESTER#  
 L51 QUE ETHER#  
 L52 QUE KETONE#  
 L53 46 SEA L49 AND (L50 OR L51 OR L52)  
 L54 35 SEA L53 AND (1840-2003)/PY, PRY  
 L55 11 SEA L45 NOT L42  
 L56 34 SEA L54 NOT (L42 OR L55)

=&gt; d l17 que stat

L4 SCR 2043 OR 1839  
 L15 STR



VAR G1=B/AL/GA/IN/TI/C/SI/GE/SN/PB/N/P/AS/SB/BI/O/S/SE/TE/PO

VAR G2=O/N

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 5

STEREO ATTRIBUTES: NONE

L17 55188 SEA FILE=REGISTRY SSS FUL L15 NOT L4

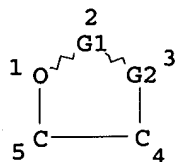
100.0% PROCESSED 87220 ITERATIONS

55188 ANSWERS

SEARCH TIME: 00.00.01

=&gt; d l24 que stat

L24 STR



VAR G1=B/AL/GA/IN/TI/C/SI/GE/SN/PB/N/P/AS/SB/BI/O/S/SE/TE/PO

VAR G2=O/N

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

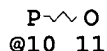
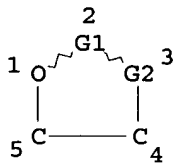
RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 5

STEREO ATTRIBUTES: NONE

=&gt; d l27 que stat

L27 STR



VAR G1=6/8/10

VAR G2=O/N

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 11

STEREO ATTRIBUTES: NONE

=&gt; fil hcap

FILE 'HCAPLUS' ENTERED AT 18:13:02 ON 15 DEC 2006

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=&gt; d l42 ibib abs hitstr hitind 1-2

L42 ANSWER 1 OF 2 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:76450 HCAPLUS

DOCUMENT NUMBER: 142:180441

TITLE: Nonaqueous electrolyte solution for secondary lithium battery and the battery

INVENTOR(S): Abe, Koji; Miyoshi, Kazuhiro; Kuwata, Takaaki

PATENT ASSIGNEE(S): Ube Industries, Ltd., Japan  
 SOURCE: PCT Int. Appl., 48 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005008829	A1	20050127	WO 2004-JP10194	20040716
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CA 2532579	AA	20050127	CA 2004-2532579	20040716
EP 1650826	A1	20060426	EP 2004-747660	20040716
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR				
CN 1853307	A	20061025	CN 2004-80026556	20040716
US 2006177742	A1	20060810	US 2006-564852	20060117
PRIORITY APPLN. INFO.:				JP 2003-198421 A 20030717
				JP 2003-383403 A 20031113
				WO 2004-JP10194 W 20040716

OTHER SOURCE(S): MARPAT 142:180441  
 GI

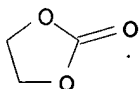
\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

AB The **electrolyte** solution contains 0.01-10% vinyl carbonate compound I (R1 and R2 = H or C1-4 alkyl groups) and 0.01-10% alkyne compds. selected from II-VII (R's and Y's defined; and x and p = 1 or 2).

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate  
RL: DEV (Device component use); USES (Uses)  
(**electrolyte** solns. containing vinyl carbonate derivs. and alkyne compds. for secondary lithium batteries)

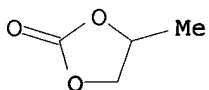
RN 96-49-1 HCAPLUS

CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



RN 108-32-7 HCAPLUS

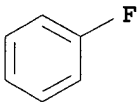
CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



IT 462-06-6, Fluorobenzene 1072-53-3, Ethylene sulfate 1717-84-6  
RL: MOA (Modifier or additive use); USES (Uses)  
(**electrolyte** solns. containing vinyl carbonate derivs. and alkyne compds. for secondary lithium batteries)

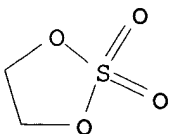
RN 462-06-6 HCAPLUS

CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



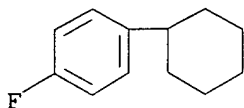
RN 1072-53-3 HCAPLUS

CN 1,3,2-Dioxathiolane, 2,2-dioxide (9CI) (CA INDEX NAME)



RN 1717-84-6 HCAPLUS

CN Benzene, 1-cyclohexyl-4-fluoro- (6CI, 7CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40  
ICS H01M004-02; H01M004-58  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST secondary lithium battery **electrolyte** soln vinyl carbonate  
deriv; acetylene group compd secondary lithium battery  
**electrolyte** soln  
IT Battery **electrolytes**  
(**electrolyte** solns. containing vinyl carbonate derivs. and  
alkyne compds. for secondary lithium batteries)  
IT 96-49-1, Ethylene carbonate 108-32-7, Propylene  
carbonate 623-53-0, Ethyl methyl carbonate 21324-40-3, Lithium  
hexafluorophosphate 90076-65-6  
RL: DEV (Device component use); USES (Uses)  
(**electrolyte** solns. containing vinyl carbonate derivs. and  
alkyne compds. for secondary lithium batteries)  
IT 98-06-6, tert-Butylbenzene 452-10-8, 2,4-Difluoroanisole  
462-06-6, Fluorobenzene 536-74-3, Phenylacetylene  
827-52-1, Cyclohexylbenzene 872-36-6, Vinylene carbonate  
1072-53-3, Ethylene sulfate 1120-71-4, 1,3-Propanesultone  
1717-84-6 2049-95-8, tert-Amylbenzene 16156-58-4,  
2-Propynyl methanesulfonate 32042-39-0 36677-73-3 61764-71-4  
71573-77-8, Di(2-propynyl) oxalate 79493-91-7, Dipropargyl  
carbonate 131166-79-5 197244-15-8 347396-84-3 406725-07-3  
833427-83-1  
RL: MOA (Modifier or additive use); USES (Uses)  
(**electrolyte** solns. containing vinyl carbonate derivs. and  
alkyne compds. for secondary lithium batteries)  
REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

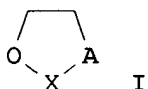
L42 ANSWER 2 OF 2 HCAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2004:569731 HCAPLUS  
DOCUMENT NUMBER: 141:108932  
TITLE: **Electrolyte** for rechargeable lithium  
battery  
INVENTOR(S): Noh, Hyeong-gon; Song, Eui-hwan  
PATENT ASSIGNEE(S): S. Korea  
SOURCE: U.S. Pat. Appl. Publ., 9 pp.  
CODEN: USXXCO  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

*Current Application*

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004137332	A1	20040715	US 2003-743638	20031222
KR 2004058634	A	20040705	KR 2002-84987	200212

JP 2004214189 A2 20040729 JP 2003-425254 27  
200312  
22  
CN 1512618 A 20040714 CN 2003-10124613 200312  
27  
PRIORITY APPLN. INFO.: KR 2002-84987 A 200212  
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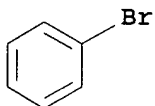
GI



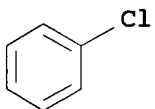
AB Disclosed is an **electrolyte** including a nonaq. organic solvent, a lithium salt and an additive represented by (I) where X is a functional group with Y, where Y is an element belonging to Groups 3, 4, 5, or 6 of the Periodic Table; and A is O or NR, where R is a C1-6 alkyl group; wherein, if X is CO, A is NR. Batteries using such a solvent in the **electrolyte** are less susceptible to swelling without any decrease in capacity or cycle life characteristics.

IT 108-86-1, Bromobenzene, uses 108-90-7,  
Chlorobenzene, uses 462-06-6, Fluorobenzene  
591-50-4, Iodobenzene  
RL: DEV (Device component use); USES (Uses)  
(**electrolyte** for rechargeable lithium battery)

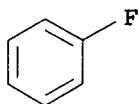
RN 108-86-1 HCAPLUS  
CN Benzene, bromo- (8CI, 9CI) (CA INDEX NAME)



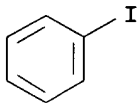
RN 108-90-7 HCAPLUS  
CN Benzene, chloro- (8CI, 9CI) (CA INDEX NAME)



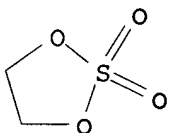
RN 462-06-6 HCAPLUS  
CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 591-50-4 HCAPLUS  
 CN Benzene, iodo- (8CI, 9CI) (CA INDEX NAME)



IT 1072-53-3, 1,3,2-Dioxathiolane-2,2-dioxide  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (electrolyte for rechargeable lithium battery)  
 RN 1072-53-3 HCAPLUS  
 CN 1,3,2-Dioxathiolane, 2,2-dioxide (9CI) (CA INDEX NAME)



IC ICM H01M010-40  
 ICS H01M004-58  
 INCL 429329000; 429231800  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST electrolyte rechargeable lithium battery  
 IT Battery electrolytes  
 (electrolyte for rechargeable lithium battery)  
 IT Esters, uses  
 Ethers, uses  
 Ketones, uses  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte for rechargeable lithium battery)  
 IT Secondary batteries  
 (lithium; electrolyte for rechargeable lithium battery)  
 IT 71-43-2D, Benzene, halogenated 108-86-1, Bromobenzene,  
 uses 108-90-7, Chlorobenzene, uses 462-06-6,  
 Fluorobenzene 463-79-6D, Carbonic acid, ester, cyclic 463-79-6D,  
 Carbonic acid, ester, linear 591-50-4, Iodobenzene  
 7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate  
 12190-79-3, Cobalt lithium oxide colio2 14283-07-9, Lithium  
 tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate  
 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium  
 triflate  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte for rechargeable lithium battery)  
 IT 144-62-7, Oxalic acid, uses 1072-53-3,  
 1,3,2-Dioxathiolane-2,2-dioxide  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (electrolyte for rechargeable lithium battery)

=> d 155 ibib abs hitstr hitind 1-11

L55 ANSWER 1 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2006:977382 HCAPLUS  
DOCUMENT NUMBER: 145:360086  
TITLE: Nonaqueous **electrolytes** for lithium  
ion batteries  
INVENTOR(S): Chen, Zonghai; Amine, Khalil  
PATENT ASSIGNEE(S): The University of Chicago, USA  
SOURCE: U.S. Pat. Appl. Publ., 20pp.  
CODEN: USXXCO  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2006210883	A1	20060921	US 2006-373054	200603 10
WO 2006101779	A2	20060928	WO 2006-US8664	200603 10
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
PRIORITY APPLN. INFO.: US 2005-662056P P				200503 15

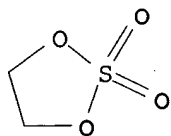
OTHER SOURCE(S): MARPAT 145:360086

AB The present invention is generally related to **electrolytes** containing anion receptor additives to enhance the power capability of lithium-ion batteries. The anion receptor of the present invention is a Lewis acid that can help to dissolve LiF in the passivation films of lithium-ion batteries. Accordingly, one aspect the invention provides **electrolytes** comprising a lithium salt; a polar aprotic **solvent**; and an anion receptor additive; and wherein the **electrolyte** solution is substantially non-aqueous. Further there are provided electrochem. devices employing the **electrolyte** and methods of making the **electrolyte**.

IT 1072-53-3D, Ethylene sulfate, aryloxy compound  
RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. **electrolytes** for lithium ion batteries)

RN 1072-53-3 HCAPLUS

CN 1,3,2-Dioxathiolane, 2,2-dioxide (9CI) (CA INDEX NAME)



INCL 429326000; 429329000; 429200000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium secondary battery nonaq **electrolyte**

IT Lewis acids

RL: MOA (Modifier or additive use); USES (Uses)  
(anion receptor; nonaq. **electrolytes** for lithium ion batteries)

IT **Solvents**

(aprotic, polar; nonaq. **electrolytes** for lithium ion batteries)

IT Cyclophosphazenes

RL: MOA (Modifier or additive use); USES (Uses)  
(aryloxy compound; nonaq. **electrolytes** for lithium ion batteries)

IT Secondary batteries

(lithium; nonaq. **electrolytes** for lithium ion batteries)

IT **Battery electrolytes**

(nonaq. **electrolytes** for lithium ion batteries)

IT 60-29-7, Diethyl ether, uses 79-20-9, Methyl acetate 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 109-60-4, Propyl acetate 126-33-0, Sulfolane 141-78-6, Ethyl acetate, uses 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 7439-93-2D, Lithium, salt 39457-42-6, Lithium manganese oxide 346417-97-8, Cobalt lithium manganese nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)

RL: DEV (Device component use); USES (Uses)  
(nonaq. **electrolytes** for lithium ion batteries)

IT 78-19-3, 3,9-Divinyl-2,4,8,10-tetraoxaspiro[5,5]undecane 84-15-1, o-Terphenyl 84-15-1D, o-Terphenyl, aryloxy compound 86-74-8D, Carbazole, aryloxy compound 88-12-0, 1-Vinylpyrrolidin-2-one, uses 91-19-0, Quinoxaline 91-20-3, Naphthalene, uses 91-22-5, Quinoline, uses 91-22-5D, Quinoline, aryloxy compound 92-52-4, Biphenyl, uses 96-49-1D, Ethylene carbonate, diaryloxy compound 96-54-8, n-Methylpyrrole 101-84-8, Diphenyl ether 101-84-8D, Diphenyl ether, diaryloxy compound 102-09-0, Diphenyl carbonate 102-09-0D, Phenyl carbonate, aryloxy compound 102-09-0D, Phenyl carbonate, diaryloxy compound 102-71-6, Triethanolamine, uses 106-92-3, Allylglycidyl ether 106-99-0, Butadiene, uses 108-32-7D, Propylene carbonate, diaryloxy compound 109-93-3, Divinyl ether 109-97-7D, Pyrrole, aryloxy compound 109-99-9D, Thf, aryloxy compound 110-00-9D, Furan, diaryloxy compound 110-86-1, Pyridine, uses 110-89-4, Piperidine, uses 110-89-4D, Piperidine, aryloxy compound 111-34-2, Butyl vinyl ether 119-65-3, Isoquinoline 120-72-9, Indole, uses 120-92-3D, Cyclopentanone, aryloxy compound 140-67-0, 4-Allylanisole 142-96-1D, Butyl ether, aryloxy compound 176-53-4D, Ethylene silicate, aryloxy compound 176-53-4D, Ethylene silicate, diaryloxy compound 287-23-0D, Cyclobutane, aryloxy compound 288-32-4, Imidazole, uses 288-32-4D, Imidazole, aryloxy compound 289-80-5, Pyridazine 289-80-5D, Pyridazine, aryloxy compound 289-95-2, Pyrimidine 290-37-9, Pyrazine 290-37-9D, Pyrazine,

aryloxy compound 291-37-2D, Cyclotriphosphazene, diaryloxy compound  
503-30-0D, Oxetane, aryloxy compound 614-99-3D, Ethyl-2-furoate,  
aryloxy compound 856-46-2, Tris(4-fluorophenyl) borate 930-22-3  
1072-53-3D, Ethylene sulfate, aryloxy compound  
1072-53-3D, Ethylene sulfate, diaryloxy compound 1072-60-2,  
2-Vinyltetrahydrofuran 1095-03-0, Triphenyl borate 1109-15-5,  
Tris(pentafluorophenyl)borane 1118-58-7 1337-81-1 1917-10-8,  
Vinyl-2-furoate 3741-38-6D, Ethylene sulfite, aryloxy compound  
3741-38-6D, Ethylene sulfite, diaryloxy compound 3893-03-6,  
4-Methoxy-o-terphenyl 4177-16-6, Vinyl pyrazine 4245-37-8, Vinyl  
methacrylate 4370-23-4, 1-Vinyl-piperidin-2-one 4427-96-7, Vinyl  
ethylene carbonate 5009-27-8D, Cyclopropanone, 2-aryl derivative  
5009-27-8D, Cyclopropanone, 2-aryloxy derivative 5009-27-8D,  
Cyclopropanone, aryloxy compound 6622-92-0, 2,4-Dimethyl-6-hydroxy-  
pyrimidine 6919-80-8, Tris(1,1,1,3,3,3-hexafluoropropan-2-yl)  
borate 7570-02-7, Divinyl carbonate 7791-03-9 10411-26-4D,  
Butyl carbonate, diaryloxy compound 11099-06-2D, Ethyl silicate,  
diaryloxy compound 12789-45-6, Methyl phosphate 12789-45-6D,  
Methyl phosphate, diaryloxy compound 13537-32-1D, Fluorophosphoric  
acid, alkyl derivative, lithium salt 14265-44-2D, Phosphate, aryloxy  
compound 14283-07-9, Lithium tetrafluoroborate 14861-06-4, Vinyl  
crotonate 15896-04-5 16410-02-9, 1-Vinylaziridin-2-one  
18358-13-9D, Methacrylate, aryloxy compound 19024-82-9, Phosphoric  
acid, trivinyl ester 21324-40-3, Lithium hexafluorophosphate  
21994-23-0 23462-75-1, Dihydropyran-3-one 23542-71-4  
24213-83-0, Pyrazine, 2,5-divinyl 29383-23-1, Vinylimidazole  
29935-35-1, Lithium hexafluoroarsenate 30676-86-9, Piperidine,  
vinyl 30851-79-7 31094-36-7, Quinoline, vinyl 32766-52-2,  
Tris(1,1,1,3,3,3-hexafluoro-2-(trifluoromethyl)propan-2-yl) borate  
32893-16-6, Methyl vinyl carbonate 33454-82-9, Lithium triflate  
33879-62-8, 2-Vinyloxetane 34721-16-9D, Furoate, 2-aryloxy compound  
34721-16-9D, Furoate, 2-diaryloxy derivative 35143-18-1 36885-49-1,  
Vinyl phosphate 37203-76-2, Ethyl phosphate 38888-98-1,  
Diphenylethane 41824-21-9D, Crotonate, aryloxy compound  
41824-21-9D, Crotonate, diaryloxy compound 44414-27-9 44866-76-4  
50337-14-9, 3-Vinylcyclopentanone 51222-11-8 53627-36-4,  
 $\beta$ -Vinyl- $\gamma$ -butyrolactone 55849-58-6 61548-40-1,  
Anisole, allyl 65967-52-4 66166-61-8, 3-Vinylcyclobutanone  
66281-01-4 66281-16-1 66956-76-1 72607-84-2,  
2,4-Divinyl-1,3-dioxane 75454-86-3 77208-21-0 90076-65-6  
104531-81-9 117823-03-7 121712-01-4, 1-Vinylazetidin-2-one  
125812-49-9 132404-42-3 132843-44-8 139669-84-4 146355-12-6,  
Tris(pentafluorophenyl)borate 210834-28-9, Tris(1,1,1,3,3,3-  
hexafluoro-2-phenylpropan-2-yl) borate 210834-35-8,  
Tris(2,4-difluorophenyl) borate 210834-37-0, Tris(2,3,5,6-  
tetrafluorophenyl) borate 210834-40-5, Tris(3-  
(trifluoromethyl)phenyl) borate 210834-42-7, Tris(3,5-  
bis(trifluoromethyl)phenyl) borate 244761-29-3, Lithium  
bisoxalatoborate 247229-51-2 365458-32-8, 2-(2,4-Difluorophenyl)-  
4-fluoro-1,3,2-benzodioxaborole 365458-33-9 365458-34-0  
365458-35-1 365458-36-2 365458-37-3 365458-38-4 365458-39-5  
365458-40-8 402564-35-6, 2-(3-Trifluoromethylphenyl)-4-fluoro-  
1,3,2-benzodioxaborole 409071-16-5 557084-91-0 678966-16-0  
856785-12-1 866947-06-0 891828-02-7 891828-03-8 891828-04-9  
891828-05-0 891828-06-1 891831-48-4 897028-09-0 897028-10-3  
897028-11-4 897028-12-5, 2-Amino-4-vinylcyclobutanone  
897028-13-6 897028-14-7 897028-15-8 897028-16-9 897028-17-0  
897028-18-1 897028-19-2 897028-20-5 897028-22-7 897028-23-8  
897028-24-9 897028-25-0 897028-26-1 897028-27-2 897028-28-3  
897028-28-3D, diaryloxy compound 897381-31-6 897381-32-7

897381-34-9 897381-36-1 897381-37-2 897381-38-3 897381-41-8  
897381-42-9 897381-44-1 897381-45-2 897381-46-3 897381-47-4  
908587-13-3 908587-22-4 908599-70-2 908599-71-3 908599-72-4  
908599-74-6 910038-86-7 910038-87-8 910038-88-9

910041-64-4D, aryloxy compound 910041-65-5D, diaryloxy compound

RL: MOA (Modifier or additive use); USES (Uses)

(nonaq. **electrolytes** for lithium ion batteries)

IT 7789-24-4, Lithium fluoride, processes

RL: REM (Removal or disposal); PROC (Process)

(nonaq. **electrolytes** for lithium ion batteries)

L55 ANSWER 2 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2006:918504 HCAPLUS

DOCUMENT NUMBER: 145:317962

TITLE: Novel redox shuttles for overcharge protection  
of lithium batteries

INVENTOR(S): Amine, Khalil; Chen, Zonghai; Wang, Qingzheng

PATENT ASSIGNEE(S): The University of Chicago, USA

SOURCE: U.S. Pat. Appl. Publ., 18pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2006199080	A1	20060907	US 2006-366891	20060301
WO 2006094069	A2	20060908	WO 2006-US7297	20060301

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

PRIORITY APPLN. INFO.: US 2005-657850P P 20050302

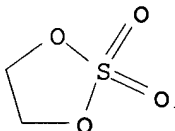
OTHER SOURCE(S): MARPAT 145:317962

AB The present invention is generally related to **electrolytes** containing novel redox shuttles for overcharge protection of lithium-ion batteries. The redox shuttles are capable of thousands hours of overcharge tolerance and have a redox potential at about 3-5.5 V vs.Li and particularly about 4.4-4.8 V vs.Li and particularly about 4.4-4.8 V vs.Li. Accordingly, in one aspect the invention provides **electrolytes** comprising an alkali metal salt; a polar aprotic **solvent**; and a redox shuttle additive that is an aromatic compound having at least one aromatic ring with four or more

electroneg. substituents, two or more oxygen atoms bonded to the aromatic ring, and no hydrogen atoms bonded to the aromatic ring; and wherein the **electrolyte** solution is substantially nonaq.

Further there are provided electrochem. devices employing the **electrolyte** and methods of making the **electrolyte**.

- IT 1072-53-3D, Ethylene sulfate, aryloxy derivative  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (redox shuttles for overcharge protection of lithium batteries)  
 RN 1072-53-3 HCAPLUS  
 CN 1,3,2-Dioxathiolane, 2,2-dioxide (9CI) (CA INDEX NAME)



- INCL 429326000; 429327000; 429328000; 429329000; 429212000; 429246000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 IT Battery **electrolytes**  
 (redox shuttles for overcharge protection of lithium batteries)  
 IT 78-19-3, 3,9-Divinyl-2,4,8,10-tetraoxaspiro[5,5]undecane 84-15-1,  
 o-Terphenyl 84-15-1D, o-Terphenyl, aryloxy derivative 86-74-8D,  
 Carbazole, aryloxy derivative 86-74-8D, Carbazole, aryloxy  
 trivinylphosphate derivs. 88-12-0, 1-Vinylpyrrolidin-2-one, uses  
 88-14-2D, 2-Furoic acid, aryloxy derivative 91-19-0, Quinoxaline  
 91-20-3, Naphthalene, uses 91-22-5, Quinoline, uses 91-22-5D,  
 Quinoline, alkoxy derivative 92-52-4, Biphenyl, uses 92-52-4D,  
 Biphenyl, methoxy vinyl derivs. 96-49-1D, Ethylene carbonate,  
 diaryloxy derivative 96-54-8, n-Methylpyrrole 101-84-8 101-84-8D,  
 Diphenyl ether, diaryloxy derivative 102-09-0, Diphenyl carbonate  
 102-09-0D, Phenyl carbonate, aryloxy derivative 102-09-0D, Phenyl  
 carbonate, diaryloxy derivative 102-71-6, Triethanolamine, uses  
 103-29-7, 1,2-Diphenylethane 106-92-3, Allylglycidyl ether  
 106-99-0, Butadiene, uses 108-32-7D, Propylene carbonate,  
 diaryloxy derivative 109-93-3, Divinyl ether 109-97-7D, Pyrrole,  
 alkoxy derivative 109-97-7D, Pyrrole, aryloxy derivative 109-99-9D, Thf,  
 aryloxy derivative 110-00-9D, Furan, diaryloxy derivative 110-86-1,  
 Piperidine, uses 110-89-4, Piperidine, uses 110-89-4D, Piperidine,  
 aryloxy derivative 111-34-2, Butyl vinyl ether 119-65-3,  
 Isoquinoline 120-72-9, Indole, uses 120-92-3D, Cyclopentanone,  
 aryloxy derivative 140-67-0, 4-Allylanisole 142-96-1D, Butyl ether,  
 aryloxy derivative 176-53-4D, Ethylene silicate, aryloxy derivative  
 176-53-4D, Ethylene silicate, diaryloxy derivative 287-23-0D,  
 Cyclobutane, aryloxy derivative 288-32-4, Imidazole, uses 288-32-4D,  
 Imidazole, aryloxy derivative 289-80-5, Pyridazine 289-80-5D,  
 Pyridazine, aryloxy derivative 289-95-2, Pyrimidine 290-37-9,  
 Pyrazine 290-37-9D, Pyrazine, aryloxy derivative 291-37-2D,  
 Cyclotriphosphazene, diaryloxy derivative 503-30-0D, Oxetane, aryloxy  
 derivative 614-99-3D, Ethyl-2-furoate, aryloxy derivative 930-22-3  
 1072-53-3D, Ethylene sulfate, aryloxy derivative  
 1072-53-3D, Ethylene sulfate, diaryloxy derivative 1118-58-7  
 1337-81-1, Vinyl Pyridine 1917-10-8, Vinyl 2-furoate 3724-65-0D,  
 Crotonic acid, aryloxy derivative 3741-38-6D, Ethylene sulfite,  
 aryloxy derivative 3741-38-6D, Ethylene sulfite, diaryloxy derivative  
 4177-16-6, Vinylpyrazine 4245-37-8, Vinyl methacrylate  
 4370-23-4, 1-Vinylpiperidin-2-one 4427-96-7, Vinyl ethylene  
 carbonate 5009-27-8D, Cyclopropanone, 2-aryl derivative 5009-27-8D,

Cyclopropanone, 2-aryloxy derivative 5009-27-8D, Cyclopropanone, aryloxy derivative 6622-92-0, 2,4-Dimethyl-6-hydroxy-pyrimidine 7486-94-4 7570-02-7, Divinyl carbonate 10411-26-4D, Butyl carbonate, diaryloxy derivative 11099-06-2D, Ethyl silicate, diaryloxy derivative 12789-45-6, Methyl phosphate 12789-45-6D, Methyl phosphate, diaryloxy derivative 14265-44-2D, Phosphate, aryloxy derivative 14861-06-4, Vinyl crotonate 15599-91-4D, aryloxy derivs. 15896-04-5 16410-02-9 18358-13-9D, Methacrylate, aryloxy derivative 21994-23-0 23462-75-1, Dihydropyran-3-one 29383-23-1, Vinyl Imidazole 30676-86-9 30851-79-7 31094-36-7 32893-16-6, Methyl vinyl carbonate 33879-62-8, 2-Vinyloxetane 34721-16-9D, Furoate, 2-diaryloxy derivative 35143-18-1 36885-49-1, Vinyl phosphate 37203-76-2, Ethyl phosphate 37275-48-2D, Bipyridine, vinyl methoxy derivs. 41824-21-9D, Crotonate, diaryloxy derivative 44414-27-9 44866-76-4 50337-14-9, 3-Vinylcyclopentanone 51222-11-8 53627-36-4,  $\beta$ -Vinyl- $\gamma$ -butyrolactone 55849-58-6 61548-40-1 65967-52-4 66166-61-8, 3-Vinylcyclobutanone 66281-01-4 66281-16-1 66956-76-1 72607-84-2 75454-86-3 77208-21-0 80345-98-8 99018-41-4 121712-01-4 139669-84-4 247229-51-2 365458-36-2 557084-91-0 856785-12-1 891828-02-7 891828-03-8 891828-04-9 891828-05-0 891828-06-1 897028-08-9 897028-09-0 897028-10-3 897028-11-4 897028-12-5 897028-13-6 897028-14-7 897028-15-8 897028-16-9 897028-17-0 897028-18-1 897028-19-2 897028-20-5 897028-21-6 897028-22-7 897028-24-9 897028-25-0 897028-26-1 897028-27-2 897028-28-3 897028-28-3D, diaryloxy derivative 897381-27-0 897381-28-1 897381-29-2 897381-31-6 897381-36-1 897381-38-3 897381-40-7 897381-41-8 897381-42-9 897381-43-0 897381-44-1 897381-45-2 897381-46-3 897381-47-4 908587-10-0 908587-13-3 908587-17-7 908587-21-3 908587-22-4 908599-70-2 908599-71-3 908599-72-4 908599-73-5 908599-74-6 908599-75-7 908599-76-8

RL: MOA (Modifier or additive use); USES (Uses)  
(redox shuttles for overcharge protection of lithium batteries)

L55 ANSWER 3 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2006:657261 HCAPLUS

DOCUMENT NUMBER: 145:127575

TITLE: Long life lithium batteries with stabilized electrodes

INVENTOR(S): Amine, Khalil; Liu, Jun; Vissers, Donald R.; Lu, Wenquan

PATENT ASSIGNEE(S): The University of Chicago, USA

SOURCE: U.S. Pat. Appl. Publ., 21 pp., Cont.-in-part of U.S. Ser. No. 857,365.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 2006147809	A1	20060706	US 2006-338902	20060124
US 2005019670	A1	20050127	US 2004-857365	20040528
PRIORITY APPLN. INFO.:			US 2004-857365	A2

200405  
28

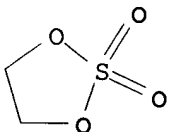
US 2005-647361P P

200501  
26

US 2003-488063P P

200307  
17

- AB The present invention relates to non-aqueous **electrolytes** having electrode stabilizing additives, stabilized electrodes, and electrochem. devices containing the same. Thus the present invention provides **electrolytes** containing an alkali metal salt, a polar aprotic **solvent**, and an electrode stabilizing additive. In certain **electrolytes**, the alkali metal salt is a bis(chelato)borate and the additives include substituted or unsubstituted linear, branched or cyclic hydrocarbons comprising at least one oxygen atom and at least one aryl, alkenyl or alkynyl group. In other **electrolytes**, the additives include a substituted aryl compound or a substituted or unsubstituted heteroaryl compound wherein the additive comprises at least one oxygen atom. There are also provided methods of making the **electrolytes** and batteries employing the **electrolytes**. The invention also provides for electrode materials. Cathodes of the present invention may be further stabilized by surface coating the particles of the spinel or olivine with a material that can neutralize acid or otherwise lessen or prevent leaching of the manganese or iron ions. In some embodiments the coating is polymeric and in other embodiments the coating is a metal oxide such as ZrO<sub>2</sub>, TiO<sub>2</sub>, ZnO, WO<sub>3</sub>, Al<sub>2</sub>O<sub>3</sub>, MgO, SiO<sub>2</sub>, SnO<sub>2</sub>, AlPO<sub>4</sub>, Al(OH)<sub>3</sub>, a mixture of any two or more thereof.
- IT 1072-53-3D, Ethylene sulfate, aryloxy derivs.  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (long life lithium batteries with stabilized electrodes)
- RN 1072-53-3 HCAPLUS
- CN 1,3,2-Dioxathiolane, 2,2-dioxide (9CI) (CA INDEX NAME)



- INCL 429326000; 429330000
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- IT 84-15-1D, o-Terphenyl, aryloxy derivs. 86-74-8D, Carbazole, aryloxy derivs. 88-12-0, 1-Vinylpyrrolidin-2-one, uses 91-22-5D, Quinoline, aryloxy derivs. 101-84-8, Diphenyl ether 101-84-8D, Diphenyl ether, aryloxy derivs. 102-09-0, Diphenyl carbonate 102-09-0D, Phenyl carbonate, aryloxy derivs. 106-92-3, Allyl glycidyl ether 109-93-3, Divinyl ether 109-97-7D, Pyrrole, aryloxy derivs. 109-99-9D, Tetrahydrofuran, aryloxy derivs. 110-00-9D, Furan, aryloxy derivs. 110-89-4D, Piperidine, aryloxy derivs. 111-34-2, Butyl vinyl ether 120-92-3D, Cyclopentanone, aryloxy derivs. 140-67-0, 4-Allylanisole 142-96-1D, Butyl ether, aryloxy derivs. 176-53-4D, Ethylene silicate, aryloxy derivs.

288-32-4D, Imidazole, aryloxy derivs. 289-80-5D, Pyridazine, aryloxy derivs. 290-37-9D, Pyrazine, aryloxy derivs. 291-37-2D, Cyclotriphosphazene, Vinyl containing derivs. 291-37-2D, Cyclotriphosphazene, aryloxy derivs. 503-30-0D, Oxetane, aryloxy derivs. 614-99-3D, Ethyl-2-furoate, aryloxy derivs. 930-22-3 1072-53-3D, Ethylene sulfate, aryloxy derivs. 1917-10-8, Vinyl-2-furoate 3724-65-0D, Crotonic acid, aryloxy derivs. 3741-38-6D, Ethylene sulfite, aryloxy derivs. 4245-37-8, Vinyl methacrylate 4370-23-4, 1-Vinylpiperidin-2-one 4427-96-7, Vinyl ethylene carbonate 5009-27-8D, Cyclopropanone, aryloxy derivs. 6622-92-0, 2,4-Dimethyl-6-hydroxy-pyrimidine 7570-02-7, DiVinyl carbonate 12789-45-6, Methyl phosphate 14265-44-2D, Phosphate, aryloxy derivs. 14861-06-4, Vinyl crotonate 15896-04-5 16053-89-7D, 2-Furancarboxylate, aryloxy derivs. 16410-02-9 18358-13-9D, Methacrylate, aryloxy derivs. 21994-23-0 23462-75-1, Dihydropyran-3-one 32893-16-6 33879-62-8, 2-Vinyloxetane 36885-49-1, Vinyl phosphate 37203-76-2, Ethyl phosphate 37275-48-2D, Bipyridine, methoxy vinyl derivs. 44414-27-9 50337-14-9, 3-Vinylcyclopentanone 53627-36-4,  $\beta$ -Vinyl- $\gamma$ -butyrolactone 57453-76-6 61548-40-1 66166-61-8, 3-Vinylcyclobutanone 66281-16-1 66956-76-1 72607-84-2 104531-81-9 117823-03-7 121712-01-4 139669-84-4 557084-91-0 856785-12-1 866947-06-0 897028-07-8 897028-08-9 897028-09-0 897028-10-3 897028-11-4 897028-12-5 897028-13-6 897028-14-7 897028-15-8 897028-16-9 897028-17-0 897028-18-1 897028-19-2 897028-20-5 897028-21-6 897028-22-7 897028-23-8 897028-24-9 897028-25-0 897028-26-1 897028-27-2 897028-28-3 897381-27-0 897381-28-1 897381-29-2 897381-30-5 897381-31-6 897381-32-7 897381-33-8 897381-34-9 897381-35-0 897381-36-1 897381-37-2 897381-38-3 897381-39-4 897381-40-7 897381-41-8 897381-42-9 897381-43-0 897381-44-1 897381-45-2 897381-46-3 897381-47-4

RL: MOA (Modifier or additive use); USES (Uses)  
(long life lithium batteries with stabilized electrodes)

L55 ANSWER 4 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:1292320 HCAPLUS

DOCUMENT NUMBER: 144:38333

TITLE: Nonaqueous electrolyte solution for secondary lithium battery

INVENTOR(S): Abe, Koji; Miyoshi, Kazuhiro; Kuwata, Takaaki

PATENT ASSIGNEE(S): Ube Industries, Ltd., Japan

SOURCE: PCT Int. Appl., 45 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005117197	A1	20051208	WO 2005-JP9900	20050530

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU,

SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA,  
 UG, US, UZ, VC, VN, YU, ZA, ZM, ZW  
 RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW,  
 AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ,  
 DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC,  
 NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA,  
 GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.:

JP 2004-159283

A

200405

28

OTHER SOURCE(S): MARPAT 144:38333

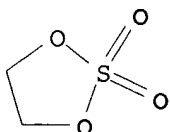
AB The **electrolyte** solution contains an **electrolyte** salt in a nonaq. **solvent** and contains 0.01-10% S acid ester and 0.01-10% triple bond compound of the formula  $R1(C.tplbond.C)PR2, R3C.tplbond.C(CR4R5)xOY1, Y2O(CR6R7)xC.tplbond.C(CR8R9)xOY3, Y4O(CR10R11)xC.tplbond.CC.tplbond.C(CR12R13)xOY5, R14C.tplbond.C(CR15R16)xOCO2(CR17R18)xC.tplbond.CR19$  or  $R2OC.tplbond.C(CR21R22)xOWOY6$  where R1 = C1-12 alkyl, C3-6 cycloalkyl, or aryl group; R2-R22 = H or C1-12 alkyl, C3-6 cycloalkyl, or aryl groups, p = 1 or 2, x = 1 or 2; R4 and R5, R6 and R7, R8 and R9, R10 and R11, R12 and R13, R15 and R16, R17 and R18, and R21 and R22 may form C3-6 cycloalkyl groups; W = -SO-, -SO2-, -COCO-; and the Y's are carboxylate ester, alkyl carbonyl, or alkyl sulfonyl groups.

IT 1072-53-3

RL: MOA (Modifier or additive use); USES (Uses)  
 (sulfur acid ester and alkyne compound additives in nonaq. **electrolyte** solns. for secondary lithium batteries)

RN 1072-53-3 HCAPLUS

CN 1,3,2-Dioxathiolane, 2,2-dioxide (9CI) (CA INDEX NAME)



IC ICM H01M010-40

ICS H01M004-02; H01M004-38; H01M004-58; H01M004-66

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery **electrolyte** sulfur acid ester alkyne compdIT Battery **electrolytes**

(sulfur acid ester and alkyne compound additives in nonaq. **electrolyte** solns. for secondary lithium batteries)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 623-53-0, Methyl ethyl carbonate 21324-40-3, Lithium hexafluorophosphate

RL: DEV (Device component use); USES (Uses)

(sulfur acid ester and alkyne compound additives in nonaq. **electrolyte** solns. for secondary lithium batteries)

IT 536-74-3, Phenylacetylene 1072-53-3 1120-71-4, Propanesultone 1633-83-6, Butanesultone 1899-25-8 3741-38-6, Glycol sulfite 16156-58-4, 2-Propynyl methanesulfonate 19828-82-1 19828-83-2 29619-56-5 61764-71-4 70886-56-5 71573-77-8, Di(2-propynyl) oxalate 406725-07-3 530158-20-4 870861-60-2

RL: MOA (Modifier or additive use); USES (Uses)  
(sulfur acid ester and alkyne compound additives in nonaq.  
**electrolyte** solns. for secondary lithium batteries)

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L55 ANSWER 5 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:1102895 HCAPLUS

DOCUMENT NUMBER: 143:350043

TITLE: Secondary lithium battery with  
**electrolyte** containing sulfur compound

INVENTOR(S): Minami, Hiroyuki; Sawa, Katsuichiro; Torimae,  
Mariko; Fukui, Atsushi; Kusumoto, Yasuyuki;  
Kamino, Maruo

PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 19 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005285563	A2	20051013	JP 2004-97970	200403 30
PRIORITY APPLN. INFO.:				200403 30

AB The claimed battery is equipped with an anode active mass layer containing Si and/or Si alloys formed on a current collector and a nonaq. **electrolyte** containing a S compound, e.g., sulfate ester compound The battery provides long cycle life by preventing cracking of the anode.

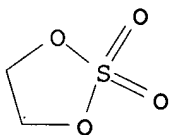
IT 1072-53-3

RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(secondary lithium battery with **electrolyte** containing sulfur compound)

RN 1072-53-3 HCAPLUS

CN 1,3,2-Dioxathiolane, 2,2-dioxide (9CI) (CA INDEX NAME)



IC ICM H01M010-40

ICS H01M004-02; H01M004-04; H01M004-38; H01M004-62; H01M004-64

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST sulfate ester nonaq **electrolyte** secondary lithium battery

IT Polyimides, uses

RL: DEV (Device component use); USES (Uses)

(binders, in anodes; secondary lithium battery with electrolyte containing sulfur compound)

IT Secondary batteries  
(lithium; secondary lithium battery with electrolyte containing sulfur compound)

IT Battery electrolytes  
(secondary lithium battery with electrolyte containing sulfur compound)

IT 7440-21-3, Silicon, uses  
RL: DEV (Device component use); USES (Uses)  
(anodes; secondary lithium battery with electrolyte containing sulfur compound)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
RL: DEV (Device component use); USES (Uses)  
(electrolyte solvents; secondary lithium battery with electrolyte containing sulfur compound)

IT 21324-40-3, Lithium hexafluorophosphate  
RL: DEV (Device component use); USES (Uses)  
(electrolytes; secondary lithium battery with electrolyte containing sulfur compound)

IT 1072-53-3  
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
(secondary lithium battery with electrolyte containing sulfur compound)

L55 ANSWER 6 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:34100 HCAPLUS

DOCUMENT NUMBER: 142:117674

TITLE: Nonaqueous electrolyte solution and secondary lithium battery

INVENTOR(S): Ogawa, Kazuya; Sano, Atsushi; Iijima, Takeshi; Maruyama, Akira

PATENT ASSIGNEE(S): TDK Corporation, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 21 pp.  
CODEN: JKXXAF

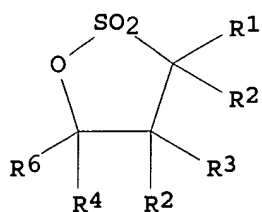
DOCUMENT TYPE: Patent

LANGUAGE: Japanese

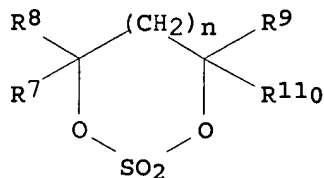
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2005011768	A2	20050113	JP 2003-177120	20030620
PRIORITY APPLN. INFO.:				20030620
				20030620
OTHER SOURCE(S): MARPAT 142:117674				
GI				



I



II

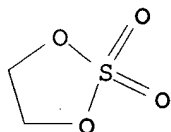
AB The **electrolyte** solution has a nonaq. **solvent** mixture and a Li salt, capable of dissolving in the **solvent** mixture; where the **solvent** mixture contains propylene carbonate, ethylene sulfide, and a compound I (R<sub>1</sub>-6 = H or C<sub>1</sub>-3 hydrocarbon group) or II (R<sub>7</sub>-10 = H or C<sub>1</sub>-4 hydrocarbon group). The battery has an insulating separator between a cathode and an anode, and the above **electrolyte** solution sealed and stored in a battery case.

IT 1072-53-3

RL: DEV (Device component use); USES (Uses)  
(**electrolyte** solns. containing dioxithiolane dioxide derivs. in **solvents** for secondary lithium battery)

RN 1072-53-3 HCAPLUS

CN 1,3,2-Dioxathiolane, 2,2-dioxide (9CI) (CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery **electrolyte solvent**  
propylene carbonate ethylene sulfide; battery **electrolyte solvent** additive dioxithiolane dioxide deriv

IT Battery **electrolytes**

(**electrolyte** solns. containing dioxithiolane dioxide derivs. in **solvents** for secondary lithium battery)

IT 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 420-12-2, Ethylene sulfide 1072-53-3 7782-42-5, Graphite, uses 9002-88-4, Polyethylene 21324-40-3, Lithium hexafluorophosphate 346417-97-8, Cobalt lithium manganese nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)

RL: DEV (Device component use); USES (Uses)

(**electrolyte** solns. containing dioxithiolane dioxide derivs. in **solvents** for secondary lithium battery)

L55 ANSWER 7 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:34099 HCAPLUS

DOCUMENT NUMBER: 142:117673

TITLE: Secondary lithium battery

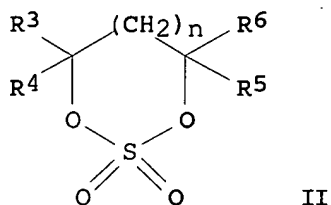
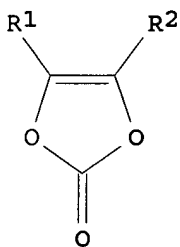
INVENTOR(S): Sano, Atsushi; Ogawa, Kazuya; Iijima, Takeshi; Maruyama, Akira

PATENT ASSIGNEE(S): TDK Corporation, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 20 pp.

DOCUMENT TYPE: CODEN: JKXXAF  
 LANGUAGE: Patent  
 FAMILY ACC. NUM. COUNT: Japanese  
 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2005011762	A2	20050113	JP 2003-176955	200306 20
PRIORITY APPLN. INFO.:			JP 2003-176955	200306 20
OTHER SOURCE(S):		MARPAT 142:117673		
GI				



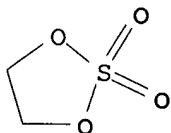
AB The battery has an insulating separator between a cathode and an anode, and a Li salt containing **electrolyte** solution sealed and stored in a battery case; where the nonaq. **solvent** of **electrolyte** solution contains propylene carbonate, ethylene carbonate, and di-Et carbonate; and the **electrolyte** solution contains a 1st compound I (R1, R2 = H or C1-6 hydrocarbon) and a 2nd compound II (R3-6 = H or C1-4 hydrocarbon; and n = 0 or 1).

IT 1072-53-3

RL: MOA (Modifier or additive use); USES (Uses)  
 (**electrolytes** containing vinylene carbonate and dioxathiolane oxide derivs for secondary lithium batteries)

RN 1072-53-3 HCAPLUS

CN 1,3,2-Dioxathiolane, 2,2-dioxide (9CI) (CA INDEX NAME)



IC ICM H01M010-40

ICS H01M002-02

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery **electrolyte** vinylene carbonate

dioxathiolane oxide deriv  
 IT Battery electrolytes  
     (electrolytes containing vinylene carbonate and  
     dioxathiolane oxide derivs for secondary lithium batteries)  
 IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
 108-32-7, Propylene carbonate 7782-42-5, Graphite, uses  
 21324-40-3, Lithium hexafluorophosphate 346417-97-8, Cobalt  
 lithium manganese nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); USES (Uses)  
     (electrolytes containing vinylene carbonate and  
     dioxathiolane oxide derivs for secondary lithium batteries)  
 IT 872-36-6, Vinylene carbonate 1072-53-3 1073-05-8  
 5689-83-8 124535-97-3  
 RL: MOA (Modifier or additive use); USES (Uses)  
     (electrolytes containing vinylene carbonate and  
     dioxathiolane oxide derivs for secondary lithium batteries)

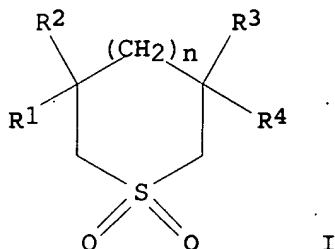
L55 ANSWER 8 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:139892 HCAPLUS  
 DOCUMENT NUMBER: 140:202395  
 TITLE: Secondary lithium battery  
 INVENTOR(S): Sano, Atsushi; Iijima, Takeshi; Maruyama, Akira  
 PATENT ASSIGNEE(S): TDK Corporation, Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 32 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

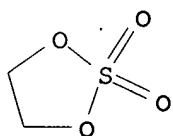
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004055502	A2	20040219	JP 2002-233801	20020809
CN 1411092	A	20030416	CN 2002-143605	20020920
US 2003113636	A1	20030619	US 2002-247511	20020920
PRIORITY APPLN. INFO.:			JP 2001-289294	A 20010921
			JP 2001-343261	A 20011108
			JP 2002-159417	A 20020531
			JP 2001-299654	A 20010928
			JP 2002-233801	A 200208

09

OTHER SOURCE(S): MARPAT 140:202395  
GI



- AB The battery has a Li-intercalating cathode, an Li-intercalating anode, and a Li+-conductive material; where (a) the conductive material contains a compound I (R1-4 = H or C1-5 alkyl group; n = 0 or 1); (b) the anode contains a compound having -CO<sub>2</sub>H or -OH group and the conductive material contains propylene carbonate; or (c) the cathode active mass is a Li containing transition metal oxide, the anode active mass is a carbonaceous material, and the conductive material as nonaq. electrolyte solution contains a linear carbonate as a low viscosity solvent in a solvent mixture of propylene carbonate and ethylene carbonate.
- IT 1072-53-3, 1,3,2-Dioxathiolane-2,2-dioxide  
RL: DEV (Device component use); USES (Uses)  
(compns. of secondary lithium batteries for improved charge-discharge cycle efficiency)
- RN 1072-53-3 HCAPLUS
- CN 1,3,2-Dioxathiolane, 2,2-dioxide (9CI) (CA INDEX NAME)



- IC ICM H01M010-40  
ICS H01M004-02; H01M004-58; H01M004-62
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- ST secondary lithium battery compn electrolyte dioxathiolane compd
- IT Secondary batteries  
(lithium; compns. of secondary lithium batteries containing dioxathiolane compds. in electrolyte solns. for improved charge-discharge cycle efficiency)
- IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
108-32-7, Propylene carbonate 127-09-3, Sodium acetate 616-38-6,  
Dimethyl carbonate 623-53-0, Methyl ethyl carbonate  
1072-53-3, 1,3,2-Dioxathiolane-2,2-dioxide 2923-18-4,  
Sodium trifluoroacetate 5689-83-8 7446-81-3, Sodium acrylate  
9002-89-5, Polyvinyl alcohol 9004-67-5, Methyl cellulose  
9005-38-3, Sodium alginate 21324-40-3, Lithium hexafluorophosphate  
124535-97-3 165108-64-5 346417-97-8, Cobalt lithium manganese

nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); USES (Uses)  
 (compsns. of secondary lithium batteries for improved  
 charge-discharge cycle efficiency)

L55 ANSWER 9 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:528004 HCAPLUS

DOCUMENT NUMBER: 138:15179

TITLE: Theoretical studies of the **solvent**  
 decomposition by lithium atoms in lithium-ion  
 battery **electrolyte**

AUTHOR(S): Han, Young-Kyu; Lee, Sang Uck; Ok, Jong-Hoa;  
 Cho, Jeong-Ju; Kim, Hyeong-Jin

CORPORATE SOURCE: Analytic and Computational Science Centre, LG  
 Chem, Ltd., Taejon, 305-380, S. Korea

SOURCE: Chemical Physics Letters (2002), 360(3,4),  
 359-366

CODEN: CHPLBC; ISSN: 0009-2614

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB We have carried out d. functional and ab initio calcns. on the  
 structure and stability of M-Lin (n=0, 1, and 2) complexes, where  
 the M=ethylene carbonate (EC), propylene carbonate (PC), vinylene  
 carbonate (VC), ethylene sulfite (ES), and glycol sulfate (GS).  
 Although the mols. are geometrically similar the reactions with  
 lithium atoms may provide various reaction products depending on the  
 structures and stabilities. Reductive decomposition by lithium atoms  
 appears to be in order of the most energetically favorable,  
 ES.apprx.GS>EC.apprx.PC>VC, and GS>PC.apprx.EC.apprx.VC>ES for the  
 first and second lithium atom addition reactions to the mols., resp.  
 The transition states are also determined and discussed for EC, VC, and  
 ES.

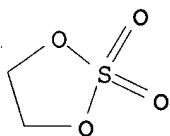
IT 1072-53-3

RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
 process); PROC (Process)

(theor. studies of the **solvent** decomposition by lithium  
 atoms in lithium-ion battery **electrolyte**)

RN 1072-53-3 HCAPLUS

CN 1,3,2-Dioxathiolane, 2,2-dioxide (9CI) (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST battery **electrolyte solvent** decompn lithium  
 atoms

IT Battery **electrolytes**

(theor. studies of the **solvent** decomposition by lithium  
 atoms in lithium-ion battery **electrolyte**)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate

872-36-6, Vinylene carbonate 1072-53-3 3741-38-6,

Ethylene sulfite 7439-93-2, Lithium, processes

RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
 process); PROC (Process)

(theor. studies of the **solvent** decomposition by lithium atoms in lithium-ion battery **electrolyte**)

REFERENCE COUNT: 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L55 ANSWER 10 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1998:466299 HCAPLUS

DOCUMENT NUMBER: 129:97750

TITLE: **Electrolyte** solutions containing cyclic sulfate esters for secondary lithium batteries

INVENTOR(S): Shima, Kuniyisa; Akawa, Shigeki; Mori, Shoichiro

PATENT ASSIGNEE(S): Mitsubishi Chemical Industries Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

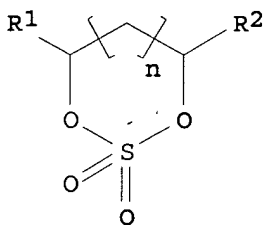
LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 10189042	A2	19980721	JP 1996-345217	19961225
JP 3760540	B2	20060329	JP 1996-345217	19961225

PRIORITY APPLN. INFO.:  
OTHER SOURCE(S): MARPAT 129:97750  
GI



AB The **electrolyte** solns. contain a Li salt, an organic **solvent** for the salt, and 0.1-50% cyclic sulfate ester I, where R1 and R2 are H or C1-2 alkyl group, and n = 0 or 1.

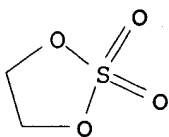
IT 1072-53-3

RL: DEV (Device component use); USES (Uses)

(**electrolyte** solns. containing cyclic sulfate esters for secondary lithium batteries)

RN 1072-53-3 HCAPLUS

CN 1,3,2-Dioxathiolane, 2,2-dioxide (9CI) (CA INDEX NAME)



IC ICM H01M010-40  
ICS C07D327-10  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST lithium battery **electrolyte** cyclic sulfate ester  
IT Battery **electrolytes**  
(**electrolyte** solns. containing cyclic sulfate esters for secondary lithium batteries)  
IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate  
1072-53-3 4426-50-0 7664-93-9D, Sulfuric acid, esters, cyclic esters, uses 21324-40-3, Lithium hexafluorophosphate  
RL: DEV (Device component use); USES (Uses)  
(**electrolyte** solns. containing cyclic sulfate esters for secondary lithium batteries)

L55 ANSWER 11 OF 11 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1994:119381 HCAPLUS  
DOCUMENT NUMBER: 120:119381  
TITLE: Electrocatalytic oxidation method for the production of cyclic sulfates and sulfamidates  
INVENTOR(S): Gao, Yun; Zepp, Charles M.  
PATENT ASSIGNEE(S): Sepracor, Inc., USA  
SOURCE: U.S., 7 pp.  
CODEN: USXXAM  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

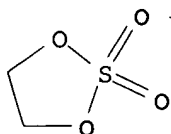
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5271812	A	19931221	US 1991-717432	19910619

PRIORITY APPLN. INFO.: US 1991-717432 19910619

OTHER SOURCE(S): MARPAT 120:119381

AB The cyclic sulfates and sulfamidates are produced from the corresponding cyclic sulfite and cyclic sulfamidite substrates, resp. The method involves the **electrolysis** of a **solvent** mixture containing active metal species, nonmetal oxidant species, and substrate.

IT 1072-53-3P, Ethylene sulfate  
RL: PREP (Preparation)  
(production of, electrocatalytic oxidation method for)  
RN 1072-53-3 HCAPLUS  
CN 1,3,2-Dioxathiolane, 2,2-dioxide (9CI) (CA INDEX NAME)



IC ICM C25B003-00  
 INCL 204-59R  
 CC 72-4 (Electrochemistry)  
 Section cross-reference(s): 28  
 IT 1072-53-3P, Ethylene sulfate 1073-05-8P 4440-89-5P  
 6970-90-7P 52393-63-2P 63082-73-5P 117470-91-4P 127854-44-8P  
 152918-93-9P 152918-95-1P 152918-96-2P 152985-13-2P  
 RL: PREP (Preparation)  
 (production of, electrocatalytic oxidation method for)

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L56 ANSWER 1 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2005:394066 HCAPLUS  
 DOCUMENT NUMBER: 142:433099  
 TITLE: **Electrolyte** for rechargeable lithium  
 battery  
 INVENTOR(S): Kim, Jin-Hee; Kim, Jin-Sung  
 PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea  
 SOURCE: Eur. Pat. Appl., 50 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1528616	A2	20030504	EP 2004-90417	20041101
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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR, IS, YU				
KR 2005041859	A	20050504	KR 2004-65773	20040820
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JP 2005142157	A2	20050602	JP 2004-318586	20041101
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US 2005142448	A1	20050630	US 2004-980116	20041101
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CN 1770541	A	20060510	CN 2004-10104744	20041101

PRIORITY APPLN. INFO.:

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KR 2003-76913

A

200310  
31<--  
KR 2004-65773

A

200408  
20

## OTHER SOURCE(S):

MARPAT 142:433099

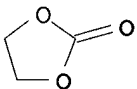
AB Disclosed is an **electrolyte** for a rechargeable lithium battery including: a first additive having an oxidation potential of 4.1 to 4.6 V; a second additive having an oxidation potential of 4.4 to 5.0 V; and a nonaq. organic **solvent**; and a lithium salt.

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 108-90-7, Chlorobenzene, uses 462-06-6, Fluorobenzene 4437-85-8, Butylene carbonate 25496-08-6, Fluorotoluene 27359-10-0, Trifluorotoluene

RL: DEV (Device component use); USES (Uses)  
(**electrolyte** for rechargeable lithium battery)

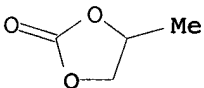
RN 96-49-1 HCAPLUS

CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



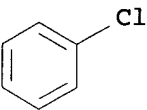
RN 108-32-7 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



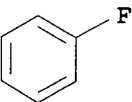
RN 108-90-7 HCAPLUS

CN Benzene, chloro- (8CI, 9CI) (CA INDEX NAME)



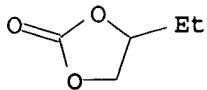
RN 462-06-6 HCAPLUS

CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 4437-85-8 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-ethyl- (9CI) (CA INDEX NAME)



RN 25496-08-6 HCAPLUS

CN Benzene, fluoromethyl- (9CI) (CA INDEX NAME)

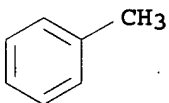


D1-F

D1-Me

RN 27359-10-0 HCAPLUS

CN Benzene, methyl-, trifluoro deriv. (9CI) (CA INDEX NAME)



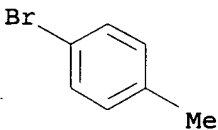
3 ( D1-F )

IT 106-38-7, 4-Bromotoluene 106-43-4, 4-Chlorotoluene  
352-32-9, 4-Fluorotoluene

RL: MOA (Modifier or additive use); USES (Uses)  
(electrolyte for rechargeable lithium battery)

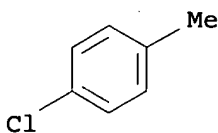
RN 106-38-7 HCAPLUS

CN Benzene, 1-bromo-4-methyl- (9CI) (CA INDEX NAME)

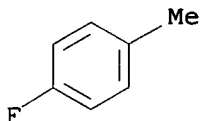


RN 106-43-4 HCAPLUS

CN Benzene, 1-chloro-4-methyl- (9CI) (CA INDEX NAME)



RN 352-32-9 HCAPLUS  
 CN Benzene, 1-fluoro-4-methyl- (9CI) (CA INDEX NAME)



IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 38  
 ST **electrolyte** rechargeable lithium battery  
 IT Alkenes, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (C2-8, copolymer with propylene; **electrolyte** for  
 rechargeable lithium battery)  
 IT Battery **electrolytes**  
 (**electrolyte** for rechargeable lithium battery)  
 IT Aromatic hydrocarbons, uses  
 Esters, uses  
 Ethers, uses  
 Ketones, uses  
 RL: DEV (Device component use); USES (Uses)  
 (**electrolyte** for rechargeable lithium battery)  
 IT Fluoropolymers, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (**electrolyte** for rechargeable lithium battery)  
 IT Styrene-butadiene rubber, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (**electrolyte** for rechargeable lithium battery)  
 IT Secondary batteries  
 (lithium; **electrolyte** for rechargeable lithium battery)  
 IT 71-43-2, Benzene, uses 96-49-1, Ethylene carbonate  
 98-95-3, Nitrobenzene, uses 105-58-8, Diethyl carbonate  
 108-32-7, Propylene carbonate 108-88-3, Toluene, uses  
 108-90-7, Chlorobenzene, uses 462-06-6,  
 Fluorobenzene 463-79-6D, Carbonic acid, **ester**  
 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate  
 623-96-1, Dipropyl carbonate 1330-20-7, Xylene, uses  
 4437-85-8, Butylene carbonate 7439-93-2, Lithium, uses  
 7440-44-0, Carbon, uses 7447-41-8, Lithium chloride, uses  
 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide  
 12190-79-3, Cobalt lithium oxide (CoLiO<sub>2</sub>) 14024-11-4, Lithium  
 tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate  
 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium  
 hexafluorophosphate 25496-08-6, Fluorotoluene  
 27359-10-0, Trifluorotoluene 29935-35-1, Lithium  
 hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7,  
 Ethyl propyl carbonate 37220-89-6, Aluminum lithium oxide

56525-42-9, Methyl propyl carbonate 90076-65-6 132843-44-8

RL: DEV (Device component use); USES (Uses)

(electrolyte for rechargeable lithium battery)

IT 79-41-4D, Methacrylic acid, copolymer with methacrylic alkyl ester 80-05-7, Bisphenol A, uses 80-09-1, Bisphenol S 106-38-7, 4-Bromotoluene 106-43-4, 4-Chlorotoluene 115-07-1D, Propylene, copolymer with C2-8 olefin 352-32-9, 4-Fluorotoluene 530-48-3, 1,1-Diphenyl ethylene 772-00-9, 4-Phenyl-1,3-dioxane 843-55-0, 4,4'-Cyclohexylidene bisphenol 1075-20-3, 4-Phenyl-1,3-dioxolane 1478-61-1, 4,4'-(Hexafluoroisopropylidene)diphenol 9000-11-7 9003-39-8, Polyvinylpyrrolidone 9004-34-6D, Cellulose, compds. 9004-57-3, Ethyl cellulose 9004-62-0 9004-64-2, Hydroxypropyl cellulose 9004-65-3, Hydroxypropyl methyl cellulose 9004-67-5, Methyl cellulose 9062-14-0, Ethyl hydroxypropyl cellulose 10192-62-8, Bisphenol A diacetate 24937-79-9, PVDF 25549-84-2, Polysodium acrylate

RL: MOA (Modifier or additive use); USES (Uses)

(electrolyte for rechargeable lithium battery)

IT 9003-55-8

RL: MOA (Modifier or additive use); USES (Uses)

(styrene-butadiene rubber; electrolyte for rechargeable lithium battery)

L56 ANSWER 2 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:259463 HCAPLUS

DOCUMENT NUMBER: 142:319870

TITLE: Electrolyte for lithium battery

INVENTOR(S): Lim, Hyun-Jeong; Song, Eui-Hwan

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea

SOURCE: U.S. Pat. Appl. Publ., 9 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

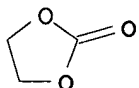
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005064294	A1	20050324	US 2004-944886	20040921
KR 2005029778	A	20050328	KR 2003-65550	20030922
PRIORITY APPLN. INFO.:			KR 2003-65550	A 20030922

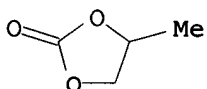
OTHER SOURCE(S): MARPAT 142:319870

AB An electrolyte for a lithium battery includes a nonaq. organic solvent, lithium salts, and an additive such as a 4-substituted imidazole where the substituent is selected from the group consisting of an alkyl, an alkoxy, a halogen, and an electron withdrawing group. The lithium battery having the electrolyte shows improved electrochem. properties, such as capacity at high rate and safety characteristics compared to a battery including the conventional nonaq. electrolyte

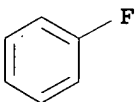
which does not include the additive compound  
IT 96-49-1, Ethylene carbonate 108-32-7, Propylene  
carbonate 462-06-6, Fluorobenzene 4437-85-8,  
Butylene carbonate 25496-08-6, Fluorotoluene  
27359-10-0, TriFluorotoluene  
RL: DEV (Device component use); USES (Uses)  
(electrolyte for lithium battery)  
RN 96-49-1 HCAPLUS  
CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



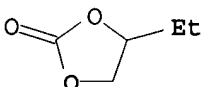
RN 108-32-7 HCAPLUS  
CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



RN 462-06-6 HCAPLUS  
CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 4437-85-8 HCAPLUS  
CN 1,3-Dioxolan-2-one, 4-ethyl- (9CI) (CA INDEX NAME)



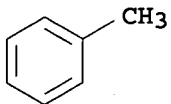
RN 25496-08-6 HCAPLUS  
CN Benzene, fluoromethyl- (9CI) (CA INDEX NAME)



D1-F

D1-Me

RN 27359-10-0 HCAPLUS  
 CN Benzene, methyl-, trifluoro deriv. (9CI) (CA INDEX NAME)



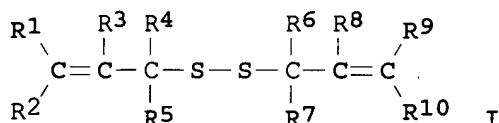
## 3 (D1-F)

IC ICM H01M010-40  
 INCL 429328000; 429200000; 429332000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST **electrolyte** additive lithium battery imidazole; safety  
 lithium battery  
 IT Battery **electrolytes**  
 (**electrolyte** for lithium battery)  
 IT Aromatic hydrocarbons, uses  
   **Esters**, uses  
   **Ethers**, uses  
   **Ketones**, uses  
 RL: DEV (Device component use); USES (Uses)  
 (**electrolyte** for lithium battery)  
 IT Secondary batteries  
 (lithium; **electrolyte** for lithium battery)  
 IT Lithium alloy, base  
 RL: DEV (Device component use); USES (Uses)  
 (**electrolyte** for lithium battery)  
 IT 71-43-2, Benzene, uses 96-49-1, Ethylene carbonate  
 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate  
 108-88-3, Toluene, uses 462-06-6, Fluorobenzene  
 463-79-6D, Carbonic acid, **ester** 616-38-6, Dimethyl  
 carbonate 623-53-0, Methyl ethyl carbonate 623-96-1, Dipropyl  
 carbonate 1330-20-7, Xylene, uses 4437-85-8, Butylene  
 carbonate 7439-93-2, Lithium, uses 7447-41-8, Lithium chloride,  
 uses 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide  
 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium  
 hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate  
 25496-08-6, Fluorotoluene 27359-10-0,  
 TriFluorotoluene 29935-35-1, Lithium hexafluoroarsenate  
 33454-82-9, Lithium triflate 35363-40-7, Ethyl propyl carbonate  
 56525-42-9, Methyl propyl carbonate 90076-65-6 131651-65-5  
 RL: DEV (Device component use); USES (Uses)  
 (**electrolyte** for lithium battery)  
 IT 3034-38-6, 4-Nitroimidazole 15965-31-8, 4-Chloroimidazole  
 18502-05-1, 4-Cyanomethylimidazole  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (**electrolyte** for lithium battery)

L56 ANSWER 3 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2005:1959 HCAPLUS  
 DOCUMENT NUMBER: 142:97467  
 TITLE: Nonaqueous **electrolyte** for a lithium  
 secondary battery  
 INVENTOR(S): Kim, Jin-sung

PATENT ASSIGNEE(S): Samsung Sdi Co., Ltd., S. Korea  
 SOURCE: U.S. Pat. Appl. Publ., 9 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004265702	A1	20041230	US 2004-869437	20040617
US 7060392	B2	20060613	<--	
KR 2005004929	A	20050113	KR 2003-42557	20030627
JP 2005019409	A2	20050120	JP 2004-187941	20040625
CN 1585186	A	20050223	CN 2004-10064039	20040628
PRIORITY APPLN. INFO.:			KR 2003-42557	A 20030627
OTHER SOURCE(S):				
GI			MARPAT 142:97467	

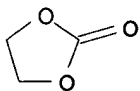


AB An **electrolyte** for a lithium secondary battery comprises lithium salts, a nonaq. organic **solvent**, and an additive compound of formula (I); where R1 to R10 are independently selected from the group consisting of a hydrogen, alkyl, alkenyl, and alkynyl. The additive compound decomps. earlier than organic **solvent** to form an SEI film, and prevents decomposition of the organic **solvent**.

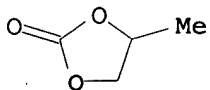
IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 4437-85-8, Butylene carbonate  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. **electrolyte** for lithium secondary battery)

RN 96-49-1 HCAPLUS

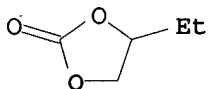
CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



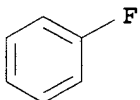
RN 108-32-7 HCAPLUS  
CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



RN 4437-85-8 HCAPLUS  
CN 1,3-Dioxolan-2-one, 4-ethyl- (9CI) (CA INDEX NAME)



IT 462-06-6, Fluorobenzene 25496-08-6, Fluorotoluene  
27359-10-0, Trifluorotoluene  
RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. electrolyte for lithium secondary battery)  
RN 462-06-6 HCAPLUS  
CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



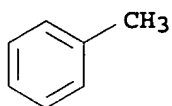
RN 25496-08-6 HCAPLUS  
CN Benzene, fluoromethyl- (9CI) (CA INDEX NAME)



D1- F

D1- Me

RN 27359-10-0 HCAPLUS  
CN Benzene, methyl-, trifluoro deriv. (9CI) (CA INDEX NAME)



3 ( D1- F )

IC ICM H01M010-40  
 INCL 429340000; X42-932.6; X42-934.2  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST lithium secondary battery nonaq **electrolyte**  
 IT Secondary batteries  
     (lithium; nonaq. **electrolyte** for lithium secondary battery)  
 IT Battery **electrolytes**  
     (nonaq. **electrolyte** for lithium secondary battery)  
 IT **Esters**, uses  
     **Ethers**, uses  
     **Ketones**, uses  
 RL: DEV (Device component use); USES (Uses)  
     (nonaq. **electrolyte** for lithium secondary battery)  
 IT Aromatic hydrocarbons, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
     (nonaq. **electrolyte** for lithium secondary battery)  
 IT **96-49-1**, Ethylene carbonate 105-58-8, Diethyl carbonate  
**108-32-7**, Propylene carbonate 463-79-6D, Carbonic acid,  
**ester** 616-38-6, Dimethyl carbonate 623-53-0, Methyl  
 ethyl carbonate 623-96-1, Dipropyl carbonate **4437-85-8**,  
 Butylene carbonate 7447-41-8, Lithium chloride, uses 10377-51-2,  
 Lithium iodide 12190-79-3, Cobalt lithium oxide (CoLiO<sub>2</sub>)  
 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium  
 tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate  
 21324-40-3, Lithium hexafluorophosphate 33454-82-9, Lithium  
 triflate 35363-40-7, Ethyl propyl carbonate 37220-89-6, Aluminum  
 lithium oxide 56525-42-9, Methyl propyl carbonate 131651-65-5  
 RL: DEV (Device component use); USES (Uses)  
     (nonaq. **electrolyte** for lithium secondary battery)  
 IT 71-43-2, Benzene, uses 108-88-3, Toluene, uses **462-06-6**,  
 Fluorobenzene 1330-20-7, Xylene, uses 2179-57-9, Allyl disulfide  
 2179-58-0, Methyl Allyl disulfide **25496-08-6**,  
 Fluorotoluene **27359-10-0**, Trifluorotoluene 72437-63-9  
 RL: MOA (Modifier or additive use); USES (Uses)  
     (nonaq. **electrolyte** for lithium secondary battery)  
 REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L56 ANSWER 4 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2004:1005148 HCAPLUS  
 DOCUMENT NUMBER: 142:243585  
 TITLE: Lithium battery with improved high temperature  
         shelf life and its manufacture  
 INVENTOR(S): Song, Ui Hwan  
 PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea  
 SOURCE: Repub. Korean Kongkae Taeho Kongbo, No pp. given  
         CODEN: KRXXA7

DOCUMENT TYPE: Patent  
 LANGUAGE: Korean  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
KR 2003034735	A	20030509	KR 2001-66454	20011026

PRIORITY APPLN. INFO.:

KR 2001-66454

20011026

AB The battery uses a polymer **electrolyte** containing a Li salt and an organic **solvent**, where the polymer is a polymer of  $\text{CH}_2:\text{C}(\text{R}_1)\text{CO}_2(\text{CH}_2\text{CH}_2\text{O})_x\text{COC}(\text{R}_2):\text{CH}_2$  ( $x$  = an integer of 2-5,  $\text{R}_1$  and  $\text{R}_2$  are independently H or Me) or I ( $a=2$ ,  $b=4$ ), and the organic **solvent** contains 20-70 wt% ethylene carbonate and 30-80 wt% of a carbonate based solvent, b.  $\geq 120^\circ$ . The organic **solvent** may also contain a fluorinated aromatic hydrocarbon compound

IT 96-49-1, 1,3-Dioxolan-2-one

RL: DEV (Device component use); USES (Uses)  
 (comps. of polymer **electrolytes** containing lithium salt and carbonate **ester solvents** for lithium batteries)

RN 96-49-1 HCAPLUS

CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)

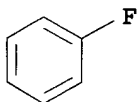


IT 462-06-6, Fluorobenzene

RL: MOA (Modifier or additive use); USES (Uses)  
 (comps. of polymer **electrolytes** containing lithium salt and carbonate **ester solvents** for lithium batteries)

RN 462-06-6 HCAPLUS

CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium battery PEO acrylate polymer **electrolyte** carbonate  
 org **solvent**; fluorinated hydrocarbon **solvent**  
 lithium battery acrylate polymer **electrolyte**

IT Battery **electrolytes**(comps. of polymer **electrolytes** containing lithium salt

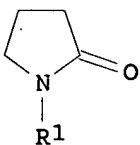
and carbonate ester solvents for lithium batteries)

- IT 96-49-1, 1,3-Dioxolan-2-one  
 RL: DEV (Device component use); USES (Uses)  
 (compns. of polymer electrolytes containing lithium salt and carbonate ester solvents for lithium batteries)
- IT 96-48-0 105-58-8 462-06-6, Fluorobenzene 93365-34-5  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (compns. of polymer electrolytes containing lithium salt and carbonate ester solvents for lithium batteries)

L56 ANSWER 5 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:999582 HCAPLUS  
 DOCUMENT NUMBER: 141:426305  
 TITLE: Nonaqueous electrolyte for a lithium secondary battery  
 INVENTOR(S): Noh, Hyung-Gon  
 PATENT ASSIGNEE(S): Samsung Sdi Co., Ltd., S. Korea  
 SOURCE: U.S. Pat. Appl. Publ., 13 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

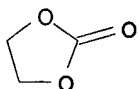
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004229128	A1	20041118	US 2004-834668	20040428
KR 2004098164	A	20041120	KR 2003-30380	20030513
JP 2004342585	A2	20041202	JP 2004-17904	20040127
CN 1551401	A	20041201	CN 2004-10045142	20040428
PRIORITY APPLN. INFO.:			KR 2003-30380	20030513
OTHER SOURCE(S):			MARPAT 141:426305	
GI				



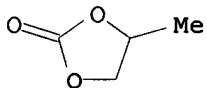
AB Disclosed is an **electrolyte** of a lithium secondary battery comprising a lithium salt, an organic **solvent**, and at least one additive compound selected from the group consisting of compds. represented by the formula (I) and derivs. thereof: where R1 is selected from the group consisting of hydrogen radicals, alkyls aryls, cycloalkyls, alkenyls, alkynyls, **ester** radicals, and aliphatic carbonate radicals. The **electrolyte** improves both swelling inhibition properties at high temperature and capacity characteristics of a lithium secondary battery.

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 462-06-6, Fluorobenzene 4437-85-8, Butylene carbonate 27359-10-0, Trifluorotoluene  
RL: DEV (Device component use); USES (Uses)  
(nonaq. **electrolyte** for lithium secondary battery)

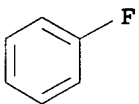
RN 96-49-1 HCAPLUS  
CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



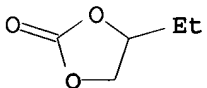
RN 108-32-7 HCAPLUS  
CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



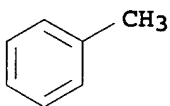
RN 462-06-6 HCAPLUS  
CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 4437-85-8 HCAPLUS  
CN 1,3-Dioxolan-2-one, 4-ethyl- (9CI) (CA INDEX NAME)

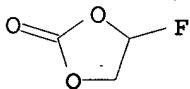


RN 27359-10-0 HCAPLUS  
CN Benzene, methyl-, trifluoro deriv. (9CI) (CA INDEX NAME)



3 ( D1-F )

IT 114435-02-8, Fluoroethylene carbonate  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (nonaq. **electrolyte** for lithium secondary battery)  
 RN 114435-02-8 HCAPLUS  
 CN 1,3-Dioxolan-2-one, 4-fluoro- (9CI) (CA INDEX NAME)



IC ICM H01M010-40  
 ICS H01M004-52; H01M004-50; H01M004-58  
 INCL 429328000; X42-933.0; X42-923.11; X42-922.3; X42-922.4; X42-923.195  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 38  
 ST **electrolyte** nonaq lithium secondary battery  
 IT Swelling, physical  
 (inhibition; nonaq. **electrolyte** for lithium secondary battery)  
 IT Secondary batteries  
 (lithium; nonaq. **electrolyte** for lithium secondary battery)  
 IT Battery **electrolytes**  
 (nonaq. **electrolyte** for lithium secondary battery)  
 IT Aromatic hydrocarbons, uses  
**Esters**, uses  
**Ethers**, uses  
**Ketones**, uses  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. **electrolyte** for lithium secondary battery)  
 IT 71-43-2, Benzene, uses 96-49-1, Ethylene carbonate  
 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate  
 108-88-3, Toluene, uses 462-06-6, Fluorobenzene  
 463-79-6D, Carbonic acid, **ester** 616-38-6, Dimethyl  
 carbonate 623-53-0, Methylethyl carbonate 623-96-1, Dipropyl  
 carbonate 1330-20-7, Xylene, uses 4437-85-8, Butylene  
 carbonate 7791-03-9, Lithium perchlorate 12355-58-7  
 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium  
 tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate  
 21324-40-3, Lithium hexafluorophosphate 27359-10-0,  
 Trifluorotoluene 29935-35-1, Lithium hexafluoroarsenate  
 33454-82-9, Lithium triflate 35363-40-7, Ethyl propyl carbonate  
 56525-42-9, Methyl propyl carbonate 90076-65-6 131651-65-5,  
 Lithium nonafluorobutanesulfonate  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. **electrolyte** for lithium secondary battery)  
 IT 88-12-0, 1Vinyl-2-pyrrolidone, uses 872-36-6, Vinylene carbonate

872-36-6D, Vinylene carbonate, derivative 872-50-4,  
1-Methyl-2-pyrrolidone, uses 2687-91-4, 1-Ethyl-2-pyrrolidone  
4641-57-0, 1-Phenyl-2-pyrrolidone 7439-93-2, Lithium, uses  
12190-79-3, Cobalt lithium oxide (CoLiO<sub>2</sub>) 114435-02-8,  
Fluoroethylene carbonate 162684-16-4, Lithium manganese nickel  
oxide

RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. **electrolyte** for lithium secondary battery)

L56 ANSWER 6 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:978247 HCAPLUS

DOCUMENT NUMBER: 142:222534

TITLE: High efficiency secondary lithium battery with  
improved low temperature properties and its  
manufacture

INVENTOR(S): Song, Ui Hwan

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea

SOURCE: Repub. Korean Kongkae Taeho Kongbo, No pp. given  
CODEN: KRXXA7

DOCUMENT TYPE: Patent

LANGUAGE: Korean

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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KR 2003034736	A	20030509	KR 2001-66455	200110 26

PRIORITY APPLN. INFO.:

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KR 2001-66455

200110  
26

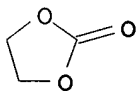
AB The battery uses a polymer **electrolyte** containing a polymer of  
CH<sub>2</sub>:CR<sub>1</sub>CO<sub>2</sub>(CH<sub>2</sub>CH<sub>2</sub>O)<sub>x</sub>COCR<sub>2</sub>:CH<sub>2</sub> ( x = 2-5, R<sub>1</sub> and R<sub>2</sub> = H or Me) or I  
(a =2, b =4), a Li salt, and an organic **solvent** containing 5-40%  
ethylene carbonate and 5-20% propylene carbonate.

IT 96-49-1, 1,3-Dioxolan-2-one 108-32-7

RL: DEV (Device component use); USES (Uses)  
(compsn. of polymer **electrolytes** containing acrylic  
polymers for secondary lithium batteries)

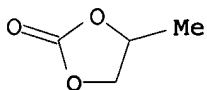
RN 96-49-1 HCAPLUS

CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)

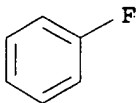


RN 108-32-7 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



IT 462-06-6, Fluorobenzene  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (compns. of polymer **electrolytes** containing acrylic  
 polymers for secondary lithium batteries)  
 RN 462-06-6 HCAPLUS  
 CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST secondary lithium battery **electrolyte** polyethylene oxide  
 acrylate; polyacrylate **ester electrolyte**  
 secondary lithium battery  
 IT Battery **electrolytes**  
 (compns. of polymer **electrolytes** containing acrylic  
 polymers for secondary lithium batteries)  
 IT Polyoxyalkylenes, uses  
 RL: DEV (Device component use); USES (Uses)  
 (compns. of polymer **electrolytes** containing acrylic  
 polymers for secondary lithium batteries)  
 IT 96-49-1, 1,3-Dioxolan-2-one 108-32-7 9051-34-7  
 21324-40-3, Lithium hexafluorophosphate 25322-68-3D, Poly(ethylene  
 oxide), (meth)acrylate **esters**, homopolymers 57636-10-9  
 RL: DEV (Device component use); USES (Uses)  
 (compns. of polymer **electrolytes** containing acrylic  
 polymers for secondary lithium batteries)  
 IT 462-06-6, Fluorobenzene  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (compns. of polymer **electrolytes** containing acrylic  
 polymers for secondary lithium batteries)

L56 ANSWER 7 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2004:905474 HCAPLUS  
 DOCUMENT NUMBER: 141:382160  
 TITLE: **Electrolyte** for rechargeable lithium  
 battery  
 INVENTOR(S): Noh, Hyung-gon; Song, Eui-hwan  
 PATENT ASSIGNEE(S): S. Korea  
 SOURCE: U.S. Pat. Appl. Publ., 9 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 2004214092	A1	20041028	US 2004-834818	200404 28
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KR 2004095852	A	20041116	KR 2003-26845	

CN 1543006

A

20041103

CN 2004-10045141

200304  
28200404  
28

JP 2004327444

A2

20041118

JP 2004-133602

200404  
28

PRIORITY APPLN. INFO.:

KR 2003-26845

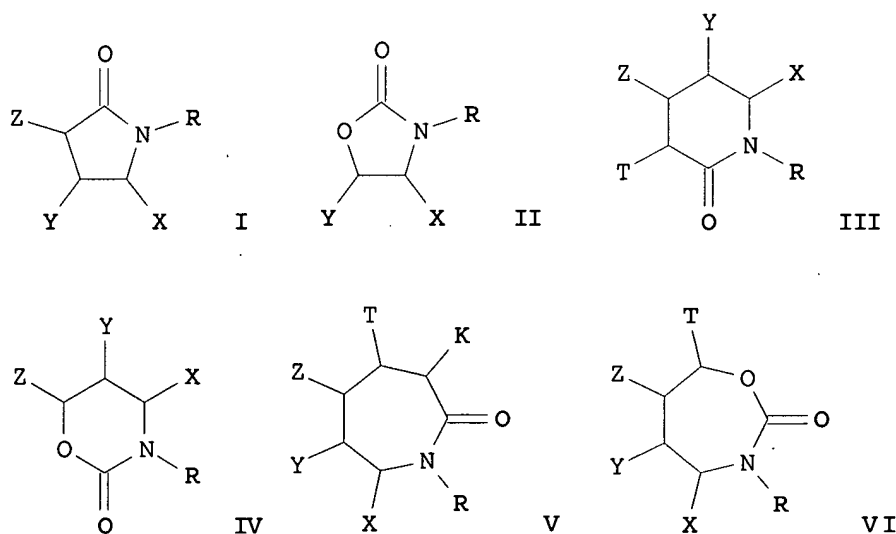
A

200304  
28

OTHER SOURCE(S):

MARPAT 141:382160

GI



AB Disclosed is an **electrolyte** for a rechargeable lithium battery including a nonaq. organic **solvent**, a lithium salt, and a lactam-based compound selected from the group consisting of compds. represented by formulas (I), (II), (III), (IV), (V). and (VI): where R is a H radical, a C 2-6 alkenyl or a halogen radical; and K, T, X, Y and Z are identically or independently H radicals or halogen radicals.

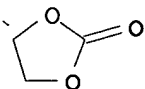
IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate

RL: DEV (Device component use); USES (Uses)

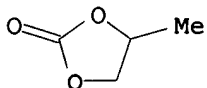
(**electrolyte** for rechargeable lithium battery)

RN 96-49-1 HCAPLUS

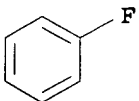
CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



RN 108-32-7 HCAPLUS  
 CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



IT 462-06-6, Fluorobenzene  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (electrolyte for rechargeable lithium battery)  
 RN 462-06-6 HCAPLUS  
 CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



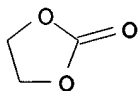
IC ICM H01M010-40  
 INCL 429328000; 429336000; 429339000; 429231800; 429330000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST electrolyte lactam based compd rechargeable lithium battery  
 IT Battery electrolytes  
 (electrolyte for rechargeable lithium battery)  
 IT Esters, uses  
 Ethers, uses  
 Ketones, uses  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte for rechargeable lithium battery)  
 IT Secondary batteries  
 (lithium; electrolyte for rechargeable lithium battery)  
 IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 463-79-6D, Carbonic acid, cyclic esters 623-53-0, Ethyl methyl carbonate 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate 12190-79-3, Cobalt lithium oxide (CoLiO2) 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium trifluoromethanesulfonate  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte for rechargeable lithium battery)  
 IT 71-43-2D, Benzene, halogenated 462-06-6, Fluorobenzene 2235-00-9, N-Vinylcaprolactam  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (electrolyte for rechargeable lithium battery)

L56 ANSWER 8 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2004:905473 HCAPLUS  
 DOCUMENT NUMBER: 141:382159

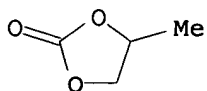
TITLE: Nonaqueous electrolyte for a lithium battery  
INVENTOR(S): Lim, Hyun-Jeong; Song, Eui-Hwan  
PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea  
SOURCE: U.S. Pat. Appl. Publ., 17 pp.  
CODEN: USXXCO  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004214091	A1	20041028	US 2004-819268	20040407
KR 2004095853	A	20041116	KR 2003-26846	20030428
CN 1543005	A	20041103	CN 2004-10031876	20040330
JP 2004327445	A2	20041118	JP 2004-133883	20040428
PRIORITY APPLN. INFO.:			KR 2003-26846	20030428

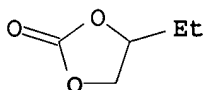
OTHER SOURCE(S): MARPAT 141:382159  
AB An electrolyte of a lithium battery includes a nonaq. organic solvent, a lithium salt, and a compound additive such as a sulfone-based compound, a carbonate-based compound, and a sulfoxide compound that substantially include aromatic hydrocarbon groups. The lithium battery utilizing the electrolyte of the present invention has improved electrochem. properties such as capacity at a high rate and safety of the battery during overcharge.  
IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 4437-85-8, Butylene carbonate  
RL: DEV (Device component use); USES (Uses)  
(nonaq. electrolyte for lithium battery)  
RN 96-49-1 HCAPLUS  
CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



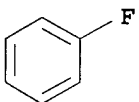
RN 108-32-7 HCAPLUS  
CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



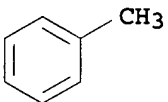
RN 4437-85-8 HCAPLUS  
CN 1,3-Dioxolan-2-one, 4-ethyl- (9CI) (CA INDEX NAME)



IT 462-06-6, Fluorobenzene 27359-10-0,  
Trifluorotoluene  
RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. **electrolyte** for lithium battery)  
RN 462-06-6 HCAPLUS  
CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 27359-10-0 HCAPLUS  
CN Benzene, methyl-, trifluoro deriv. (9CI) (CA INDEX NAME)



3 (D1-F)

IC ICM H01M010-40  
INCL 429326000; 429340000; 429343000  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST lithium battery nonaq **electrolyte**; safety lithium battery  
nonaq **electrolyte**  
IT Secondary batteries  
(lithium; nonaq. **electrolyte** for lithium battery)  
IT Battery **electrolytes**  
(nonaq. **electrolyte** for lithium battery)  
IT **Esters**, uses  
**Ketones**, uses  
RL: DEV (Device component use); USES (Uses)  
(nonaq. **electrolyte** for lithium battery)  
IT Aromatic hydrocarbons, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. **electrolyte** for lithium battery)  
IT Safety

(overcharge; nonaq. electrolyte for lithium battery)

IT Lithium alloy, base  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolyte for lithium battery)

IT 60-29-7, Ether, uses 96-49-1, Ethylene carbonate  
 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate  
 463-79-6D, Carbonic acid, chain ester 463-79-6D,  
 Carbonic acid, cyclic ester 463-79-6D, Carbonic acid,  
 ester 616-38-6, Dimethyl carbonate 623-53-0, Ethyl  
 methyl carbonate 623-96-1, Dipropyl carbonate 4437-85-8,  
 Butylene carbonate 7439-93-2, Lithium, uses 7447-41-8, Lithium  
 chloride, uses 10377-51-2, Lithium iodide 12355-58-7  
 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium  
 tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate  
 21324-40-3, Lithium hexafluorophosphate 35363-40-7, Ethyl propyl  
 carbonate 56525-42-9, Methyl propyl carbonate  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolyte for lithium battery)

IT 71-43-2, Benzene, uses 80-00-2, 4-Chlorophenyl phenyl sulfone  
 108-88-3, Toluene, uses 120-51-4, Benzyl benzoate 383-29-9,  
 Bis(4-fluorophenyl)sulfone 462-06-6, Fluorobenzene  
 599-70-2, Ethyl phenyl sulfone 621-08-9, Dibenzyl sulfoxide  
 1330-20-7, Xylene, uses 2449-35-6 3112-85-4, Methyl phenyl  
 sulfone 3406-02-8, Bisphenyl sulfonyl methane 27359-10-0  
 , Trifluorotoluene  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (nonaq. electrolyte for lithium battery)

L56 ANSWER 9 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:796490 HCAPLUS

DOCUMENT NUMBER: 141:263480

TITLE: A nonaqueous electrolyte for a lithium  
 secondary battery

INVENTOR(S): Noh, Hyeong-Gon; Jung, Cheol-Soo; Song, Eui-Hwan

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea

SOURCE: Eur. Pat. Appl., 25 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1463143	A2	20040929	EP 2003-90265	200308 21
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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
KR 2004083670	A	20041006	KR 2003-18226	200303 24
JP 2005108440	A2	20050421	JP 2003-183257	200306 26
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CN 1532986	A	20040929	CN 2003-155677	

200309  
02

US 2004197667

A1

20041007

US 2003-653192

200309  
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PRIORITY APPLN. INFO.:

KR 2003-18226

A

200303  
24

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OTHER SOURCE(S): MARPAT 141:263480

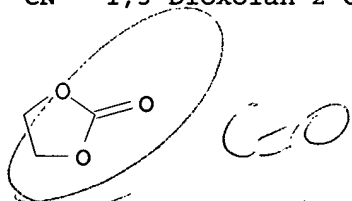
AB An **electrolyte** of a lithium secondary battery includes lithium salts, an organic **solvent** with a high b.p., and a carbonate-based additive compound having substituents selected from the group consisting of a halogen, a CN, and a NO<sub>2</sub>. The **electrolyte** improves discharge, low temperature, and cycle life characteristics of a lithium secondary battery.

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 462-06-6, Fluorobenzene 4437-85-8, Butylene carbonate 25496-08-6, Fluorotoluene 27359-10-0, TriFluorotoluene

RL: DEV (Device component use); USES (Uses)  
(nonaq. **electrolyte** for lithium secondary battery)

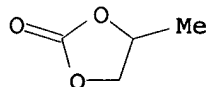
RN 96-49-1 HCAPLUS

CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



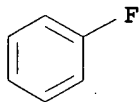
RN 108-32-7 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



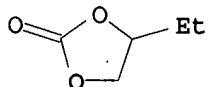
RN 462-06-6 HCAPLUS

CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 4437-85-8 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-ethyl- (9CI) (CA INDEX NAME)



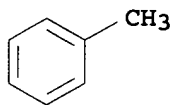
RN 25496-08-6 HCAPLUS  
CN Benzene, fluoromethyl- (9CI) (CA INDEX NAME)



D1-F

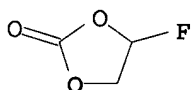
D1-Me

RN 27359-10-0 HCAPLUS  
CN Benzene, methyl-, trifluoro deriv. (9CI) (CA INDEX NAME)



3 (D1-F)

IT 114435-02-8, Fluoroethylene carbonate  
RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. **electrolyte** for lithium secondary battery)  
RN 114435-02-8 HCAPLUS  
CN 1,3-Dioxolan-2-one, 4-fluoro- (9CI) (CA INDEX NAME)



IC ICM H01M010-40  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST nonaq **electrolyte** lithium secondary battery  
IT Secondary batteries  
(lithium; nonaq. **electrolyte** for lithium secondary battery)  
IT Battery **electrolytes**  
(nonaq. **electrolyte** for lithium secondary battery)  
IT Anhydrides  
Aromatic hydrocarbons, uses  
RL: DEV (Device component use); USES (Uses)  
(nonaq. **electrolyte** for lithium secondary battery)  
IT Fluoropolymers, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. **electrolyte** for lithium secondary battery)  
IT Styrene-butadiene rubber, uses

RL: MOA (Modifier or additive use); USES (Uses)

(nonaq. **electrolyte** for lithium secondary battery)

IT 67-68-5, Dms0, uses 68-12-2, Dmf, uses 71-43-2, Benzene, uses 75-05-8, Acetonitrile, uses 79-16-3, N-Methylacetamide 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 108-88-3, Toluene, uses 123-39-7, n-Methylformamide 126-33-0, Sulfolane 462-06-6, Fluorobenzene 616-38-6, Dimethyl carbonate 616-42-2, Dimethyl sulfite 623-53-0, Methyl ethyl carbonate 623-96-1, Dipropyl carbonate 872-50-4, N-Methylpyrrolidone, uses 1330-20-7, Xylene, uses 4437-85-8, Butylene carbonate 7447-41-8, Lithium chloride, uses 7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide 12003-67-7 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 25496-08-6, Fluorotoluene 27359-10-0, TriFluorotoluene 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7, Ethyl propyl carbonate 56525-42-9, Methyl propyl carbonate 90076-65-6 131651-65-5 162684-16-4, Lithium manganese nickel oxide

RL: DEV (Device component use); USES (Uses)

(nonaq. **electrolyte** for lithium secondary battery)

IT 67-71-0, Methyl sulfone 77-77-0, Vinyl sulfone 80-05-7, uses 104-92-7, 4-Bromoanisole 127-63-9, Phenyl sulfone 452-10-8, 2,4-Difluoroanisole 456-49-5, 3-Fluoroanisole 459-60-9, 4-Fluoroanisole 463-79-6D, Carbonic acid, cyclic ester 620-32-6, Benzyl sulfone 623-12-1, 4-Chloroanisole 1073-05-8, 1,3-Propanediol cyclic sulfate 1120-71-4, Propane sultone 1888-91-1, n-Acetylcaprolactam 1889-59-4, Ethyl vinyl sulfone 2398-37-0, 3-Bromoanisole 2845-89-8, 3-Chloroanisole 3680-02-2, Methyl vinyl sulfone 5535-48-8, Phenyl vinyl sulfone 24937-79-9, PvdF 28452-93-9, Butadiene sulfone 28802-49-5, Dimethylfuran 93343-10-3, 3,5-Difluoroanisole 114435-02-8, Fluoroethylene carbonate 202925-08-4, 3-Chloro-5-fluoroanisole 756901-22-1 756901-23-2

RL: MOA (Modifier or additive use); USES (Uses)

(nonaq. **electrolyte** for lithium secondary battery)

IT 9003-55-8

RL: MOA (Modifier or additive use); USES (Uses)

(styrene-butadiene rubber; nonaq. **electrolyte** for lithium secondary battery)

L56 ANSWER 10 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:753254 HCAPLUS

DOCUMENT NUMBER: 141:228183

TITLE: A nonaqueous **electrolyte** for lithium secondary battery

INVENTOR(S): Kim, Jin-Hee; Kim, Jin-Sung; Hwang, Sang-Moon; Paik, Meen-Seon; Kim, Hak-Soo

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea; Cheil Industries Inc.

SOURCE: Eur. Pat. Appl., 33 pp.

CODEN: EPXXDW

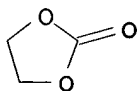
DOCUMENT TYPE: Patent

LANGUAGE: English

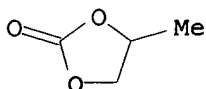
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

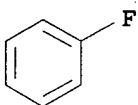
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1458048	A1	20040915	EP 2003-90262	20030821
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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
KR 2004080775	A	20040920	KR 2003-15749	20030313
JP 2005108439	A2	20050421	JP 2003-183239	20030626
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CN 1531134	A	20040922	CN 2003-155332	20030827
<--				
US 2004185347	A1	20040923	US 2003-658272	20030910
<--				
PRIORITY APPLN. INFO.:			KR 2003-15749	A 20030313
<--				
OTHER SOURCE(S): MARPAT 141:228183				
AB	An <b>electrolyte</b> for a lithium secondary battery includes lithium salts, a nonaq. organic <b>solvent</b> , and additive compds. The additive compds. added to the <b>electrolyte</b> of the present invention decompose earlier than the organic <b>solvent</b> to form a conductive polymer layer on the surface of a pos. electrode, and prevent decomposition of the organic <b>solvent</b> . Accordingly, the <b>electrolyte</b> inhibits gas generation caused by decomposition of the organic <b>solvent</b> at initial charging, and thus reduces an increase of internal pressure and swelling during high temperature storage, and also improves safety of the battery during overcharge.			
IT	96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 462-06-6, Fluorobenzene 4437-85-8, Butylene carbonate 27359-10-0, Trifluorotoluene			
RL:	DEV (Device component use); USES (Uses) (nonaq. <b>electrolyte</b> for lithium secondary battery)			
RN	96-49-1 HCAPLUS			
CN	1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)			



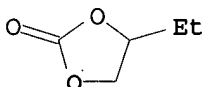
RN 108-32-7 HCAPLUS  
 CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



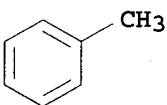
RN 462-06-6 HCAPLUS  
 CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 4437-85-8 HCAPLUS  
 CN 1,3-Dioxolan-2-one, 4-ethyl- (9CI) (CA INDEX NAME)



RN 27359-10-0 HCAPLUS  
 CN Benzene, methyl-, trifluoro deriv. (9CI) (CA INDEX NAME)



### 3 ( D1-F )

IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST nonaq **electrolyte** lithium secondary battery; safety nonaq  
**electrolyte** lithium secondary battery  
 IT Secondary batteries  
     (lithium; nonaq. **electrolyte** for lithium secondary  
     battery)  
 IT Battery **electrolytes**  
     Conducting polymers  
     Safety  
     Swelling, physical  
     (nonaq. **electrolyte** for lithium secondary battery)  
 IT Aromatic hydrocarbons, uses  
     **Esters**, uses  
     **Ethers**, uses  
     **Ketones**, uses  
     RL: DEV (Device component use); USES (Uses)  
     (nonaq. **electrolyte** for lithium secondary battery)  
 IT Lithium alloy, base  
     RL: DEV (Device component use); USES (Uses)  
     (nonaq. **electrolyte** for lithium secondary battery)

IT 67-71-0, Methylsulfone 71-43-2, Benzene, uses 77-77-0, Vinylsulfone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 108-88-3, Toluene, uses 126-33-0, Tetramethylene sulfone 127-63-9, Phenylsulfone 462-06-6, Fluorobenzene 463-79-6D, Carbonic acid, chain ester 463-79-6D, Carbonic acid, cyclic ester 463-79-6D, Carbonic acid, ester 616-38-6, Dimethyl carbonate 620-32-6, Benzylsulfone 623-53-0, Methyl ethyl carbonate 623-96-1, Dipropyl carbonate 1330-20-7, Xylene, uses 1889-59-4, Ethylvinylsulfone 3680-02-2, Methylvinylsulfone 4437-85-8, Butylene carbonate 5535-43-3, m-Chlorophenyl vinyl sulfone 5535-48-8, Phenylvinylsulfone 7439-93-2, Lithium, uses 7447-41-8, Lithium chloride (LiCl), uses 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide 14024-11-4, Aluminum lithium chloride  $AlLiCl_4$  14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 27359-10-0, Trifluorotoluene 28122-14-7, p-Fluorophenyl vinyl sulfone 28452-93-9, Butadiene sulfone 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7, Ethyl propyl carbonate 37220-89-6, Aluminum lithium oxide 39300-70-4, Lithium nickel oxide 56525-42-9, Methyl propyl carbonate 90076-65-6 131651-65-5, Lithium nonafluorobutanesulfonate 162684-16-4, Lithium manganese nickel oxide

RL: DEV (Device component use); USES (Uses)

(nonaq. electrolyte for lithium secondary battery)

IT 80-05-7, Bisphenol A, uses 95-15-8, Thianaphthene 117-80-6, 2,3-Dichloro-1,4-naphthoquinone 271-89-6, 2,3-Benzofuran 524-42-5, 1,2-Naphthoquinone 625-86-5, 2,5-Dimethylfuran 693-98-1, 2-Methylimidazole 1192-62-7, 2-Acetylfuran 1193-79-9, 2-Acetyl-5-methylfuran 4265-27-4, 2-Butylbenzofuran 7474-83-1, 3-Bromo-1,2-naphthoquinone 13243-65-7, 2,3-Dibromo-1,4-naphthoquinone 16851-82-4, 1-(Phenylsulfonyl)pyrrole

RL: MOA (Modifier or additive use); USES (Uses)

(nonaq. electrolyte for lithium secondary battery)

REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L56 ANSWER 11 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:652503 HCAPLUS

DOCUMENT NUMBER: 141:159902

TITLE: **Electrolyte** for lithium secondary battery

INVENTOR(S): Kim, Jin-Sung; Lee, Jong-Wook; Kim, Kwang-Sik; Kim, Young-Gyu; Kim, Je-Yun; Kim, Jong-Seob

PATENT ASSIGNEE(S): S. Korea

SOURCE: U.S. Pat. Appl. Publ., 12 pp., Cont.-in-part of U.S. Ser. No. 766,520.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004157133	A1	20040812	US 2003-718478	

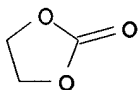
200311  
18  
US 2001-766520  
200101  
19  
US 2001-766520  
A2  
200101  
19  
KR 2000-2947  
A  
200001  
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KR 2000-81253  
A  
200012  
23

OTHER SOURCE(S): MARPAT 141:159902

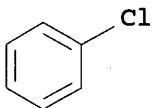
AB Described is an **electrolyte** for a lithium secondary battery. The **electrolyte** includes a nonaq. **solvent** and a sulfone-based organic compound selected from 2,5-dihydrothiophene sulfone, a cyclic sulfone with a ring size of 5 to 8, and a sulfone represented by the formula  $RSO_3R_1$  (where R and  $R_1$  are independently selected from the group consisting of primary alkyl groups, secondary alkyl groups, tertiary alkyl groups, alkenyl groups, aryl groups; halogen-substituted primary alkyl groups, halogen-substituted secondary alkyl groups, halogen-substituted tertiary alkyl groups, halogen-substituted alkenyl groups, and halogen-substituted aryl groups) or a mixture thereof.

IT 96-49-1, Ethylene carbonate 108-90-7, Chlorobenzene, uses 462-06-6, Fluorobenzene 27359-10-0, Trifluorotoluene  
RL: DEV (Device component use); USES (Uses)  
(**electrolyte** for lithium secondary battery)

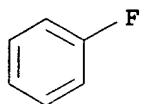
RN 96-49-1 HCAPLUS  
CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



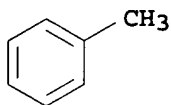
RN 108-90-7 HCAPLUS  
CN Benzene, chloro- (8CI, 9CI) (CA INDEX NAME)



RN 462-06-6 HCAPLUS  
CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 27359-10-0 HCAPLUS  
 CN Benzene, methyl-, trifluoro deriv. (9CI) (CA INDEX NAME)



3 ( D1- F )

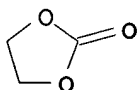
IC ICM H01M010-40  
 ICS H01M004-58; H01M004-40  
 INCL 429326000; 429199000; 429332000; 429340000; 429231950; 429231800  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST **electrolyte** lithium secondary battery  
 IT Composites  
     (carbon; **electrolyte** for lithium secondary battery)  
 IT Battery **electrolytes**  
     (**electrolyte** for lithium secondary battery)  
 IT Aromatic hydrocarbons, uses  
     RL: DEV (Device component use); USES (Uses)  
     (**electrolyte** for lithium secondary battery)  
 IT Sulfones  
     RL: MOA (Modifier or additive use); USES (Uses)  
     (**electrolyte** for lithium secondary battery)  
 IT Transition metal oxides  
     RL: DEV (Device component use); USES (Uses)  
     (lithiated; **electrolyte** for lithium secondary battery)  
 IT Secondary batteries  
     (lithium; **electrolyte** for lithium secondary battery)  
 IT 71-43-2, Benzene, uses 96-49-1, Ethylene carbonate  
     98-95-3, Nitrobenzene, uses 105-58-8, Diethyl carbonate  
     108-88-3, Toluene, uses 108-90-7, Chlorobenzene, uses  
     462-06-6, Fluorobenzene 463-79-6D, Carbonic acid,  
     **ester**, cyclic 463-79-6D, Carbonic acid, linear, cyclic,  
     uses 616-38-6, Dimethyl carbonate 623-53-0, Ethylmethyl  
     carbonate 1330-20-7, Xylene, uses 7439-93-2, Lithium, uses  
     7440-44-0, Carbon, uses 21324-40-3, Lithium hexafluorophosphate  
     27359-10-0, Trifluorotoluene  
     RL: DEV (Device component use); USES (Uses)  
     (**electrolyte** for lithium secondary battery)  
 IT 67-71-0, Methyl sulfone 77-77-0, Vinyl sulfone 96-48-0,  
     γ-Butyrolactone 126-33-0, Tetramethylene sulfone 127-63-9,  
     Phenyl sulfone 383-29-9, 4-FluoroPhenyl sulfone 620-32-6, Benzyl  
     sulfone 28452-93-9, Butadiene sulfone  
     RL: MOA (Modifier or additive use); USES (Uses)  
     (**electrolyte** for lithium secondary battery)

L56 ANSWER 12 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

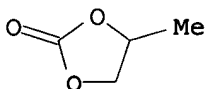
ACCESSION NUMBER: 2004:433706 HCAPLUS  
 DOCUMENT NUMBER: 140:426121  
 TITLE: **Electrolyte** for a lithium ion battery  
 INVENTOR(S): Noh, Hyeong-Gon  
 PATENT ASSIGNEE(S): S. Korea  
 SOURCE: U.S. Pat. Appl. Publ., 12 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004101762	A1	20040527	US 2003-716812	20031118
KR 2004043993	A	20040527	KR 2002-72475	20021120
JP 2004172084	A2	20040617	JP 2003-281842	20030729
CN 1523702	A	20040825	CN 2003-10124932	20031120
PRIORITY APPLN. INFO.: KR 2002-72475				20021120

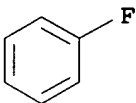
OTHER SOURCE(S): MARPAT 140:426121  
 AB An **electrolyte** for a lithium secondary battery comprises a nonaq. organic **solvent** including 20 to 95 vol% of an **ester**-based or **ether**-based organic **solvent** based on the total amount of organic **solvent**; lithium salts; and an additive compound having at least two carbonate groups. A lithium secondary battery including this **electrolyte** has good swelling inhibition properties as well as electrochem. properties such as capacity and cycle life.  
 IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 462-06-6, Fluorobenzene 4437-85-8, Butylene carbonate  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte for lithium ion battery)  
 RN 96-49-1 HCAPLUS  
 CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



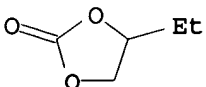
RN 108-32-7 HCAPLUS  
 CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



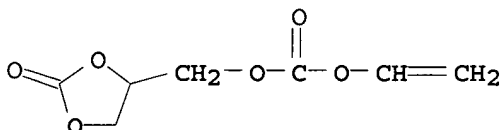
RN 462-06-6 HCAPLUS  
CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 4437-85-8 HCAPLUS  
CN 1,3-Dioxolan-2-one, 4-ethyl- (9CI) (CA INDEX NAME)



IT 692729-54-7  
RL: MOA (Modifier or additive use); USES (Uses)  
(**electrolyte** for lithium ion battery)  
RN 692729-54-7 HCAPLUS  
CN Carbonic acid, ethenyl (2-oxo-1,3-dioxolan-4-yl)methyl ester (9CI)  
(CA INDEX NAME)



IC ICM H01M010-40  
INCL 429326000; 429329000; 429330000; 429331000; 429332000; 429340000  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST **electrolyte** lithium ion battery  
IT Battery **electrolytes**  
(**electrolyte** for lithium ion battery)  
IT Aromatic hydrocarbons, uses  
Esters, uses  
Ethers, uses  
RL: DEV (Device component use); USES (Uses)  
(**electrolyte** for lithium ion battery)  
IT Sulfones  
RL: MOA (Modifier or additive use); USES (Uses)  
(**electrolyte** for lithium ion battery)  
IT Swelling, physical  
(inhibition; **electrolyte** for lithium ion battery)  
IT Secondary batteries  
(lithium; **electrolyte** for lithium ion battery)  
IT 79-20-9, Methyl acetate 96-48-0,  $\gamma$ -Butyrolactone  
96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate

108-32-7, Propylene carbonate 109-60-4, n-Propyl acetate  
141-78-6, Ethyl acetate, uses 142-96-1, Dibutyl ether  
462-06-6, Fluorobenzene 463-79-6D, Carbonic acid,  
ester 616-38-6, Dimethyl carbonate 623-53-0, Ethyl  
methyl carbonate 4437-85-8, Butylene carbonate  
7439-93-2D, Lithium, salt 7447-41-8, Lithium chloride (LiCl), uses  
7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide  
12355-58-7 14024-11-4, Lithium tetrachloroaluminate 14283-07-9,  
Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate  
21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium  
hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7,  
Ethyl propyl carbonate 56525-42-9, Methyl propyl carbonate  
90076-65-6 131651-65-5

RL: DEV (Device component use); USES (Uses)

(electrolyte for lithium ion battery)

IT 77-77-0, Vinyl sulfone 872-36-6, Vinylene carbonate 692729-49-0  
692729-52-5 692729-54-7 692729-56-9

RL: MOA (Modifier or additive use); USES (Uses)

(electrolyte for lithium ion battery)

L56 ANSWER 13 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:352048 HCAPLUS

DOCUMENT NUMBER: 140:378001

TITLE: Secondary nonaqueous electrolyte  
battery

INVENTOR(S): Matsui, Toru; Deguchi, Masaki; Sonoda, Kumiko;  
Nishimura, Makiko; Koshina, Shigeru

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 18 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004134261	A2	20040430	JP 2002-298206	200210 11
				<--
PRIORITY APPLN. INFO.: JP 2002-298206				200210 11
				<--

AB The battery comprises a cathode, an anode, and a nonaq.  
electrolyte solution, having a solute dissolved in a  
solvent mixture which contains a main solvent and a  
secondary solvent; where the secondary solvent  
comprises a compound A, selected from cyclohexyl benzene, biphenyl,  
and/or di-Ph ether, and a compound X whose oxidation potential  
is 0.1-0.4 V higher than that of the compound A; and the weight ratio of  
the secondary solvent to the solvent mixture and  
the compound X to the secondary solvent is 0.01-5 and 20-99  
resp.

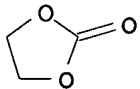
IT 96-49-1, Ethylene carbonate 321-60-8,  
2-Fluorobiphenyl 362-59-4, 2-Trifluoromethyl biphenyl  
396-64-5

RL: DEV (Device component use); USES (Uses)

(electrolyte solvents containing carbonates and aromatic compds. for secondary batteries)

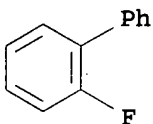
RN 96-49-1 HCAPLUS

CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



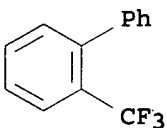
RN 321-60-8 HCAPLUS

CN 1,1'-Biphenyl, 2-fluoro- (9CI) (CA INDEX NAME)



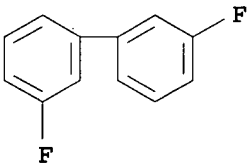
RN 362-59-4 HCAPLUS

CN 1,1'-Biphenyl, 2-(trifluoromethyl)- (9CI) (CA INDEX NAME)



RN 396-64-5 HCAPLUS

CN 1,1'-Biphenyl, 3,3'-difluoro- (9CI) (CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary battery nonaq electrolyte solvent  
carbonate arom compd

IT Battery electrolytes

(electrolyte solvents containing carbonates and aromatic compds. for secondary batteries)

IT 92-52-4, Biphenyl, uses 96-48-0,  $\gamma$ -Butyrolactone  
96-49-1, Ethylene carbonate 98-82-8 100-41-4, Phenyl  
ethane, uses 101-81-5, Diphenyl methane 101-84-8, Diphenyl  
ether 105-58-8, Diethyl carbonate 108-88-3, Phenyl  
methane, uses 321-60-8, 2-Fluorobiphenyl 330-93-8,  
Bis(4-fluorophenyl) ether 362-59-4,  
2-Trifluoromethyl biphenyl 396-64-5 519-73-3, Triphenyl  
methane 527-21-9, Tetrafluoro-p-benzoquinone 623-53-0, Ethyl

methyl carbonate 791-28-6, Triphenylphosphine oxide 827-52-1,  
 Cyclohexyl benzene 872-36-6, Vinylene carbonate 960-71-4,  
 Triphenyl borane 2367-02-4, 4-Trifluoromethyl diphenyl  
**ether** 14283-07-9, Lithium tetrafluoroborate 21324-40-3,  
 Lithium hexafluorophosphate 142990-38-3 142990-39-4  
 684215-50-7 684215-51-8

RL: DEV (Device component use); USES (Uses)  
 (electrolyte solvents containing carbonates and  
 aromatic compds. for secondary batteries)

L56 ANSWER 14 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:286863 HCAPLUS

DOCUMENT NUMBER: 140:306756

TITLE: Organic electrolytic solution for  
 lithium battery

INVENTOR(S): Kim, Ju-Yup; Ryu, Young-Gyoon; Lee, Seok-Soo;  
 Hwang, Seung-Sik

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea

SOURCE: Eur. Pat. Appl., 13 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

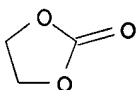
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1406339	A1	20040407	EP 2003-254312	20030708
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EP 1406339	B1	20060412		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
KR 2004031162	A	20040413	KR 2002-60530	20021004
CN 1487619	A	20040407	CN 2003-136341	20030529
<--				
US 2004067418	A1	20040408	US 2003-449775	20030602
<--				
JP 2004127943	A2	20040422	JP 2003-345737	20031003
<--				
PRIORITY APPLN. INFO.:		KR 2002-60530	A	20021004
<--				

OTHER SOURCE(S): MARPAT 140:306756

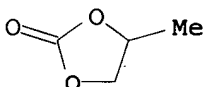
AB Provided is an organic electrolytic solution including a lithium  
 salt and an organic solvent containing an alkoxy-containing compound  
 such as 1,1,3-trimethoxypropane. When polyglyme and an organic compound  
 having dioxolane moiety are further added into the organic

electrolytic solution, a lithium metal stabilizing effect and the ionic conductivity of lithium ions are enhanced, and thus, the charging/discharging efficiency of lithium is greatly improved. Such an organic electrolytic solution can be effectively used for any kind of lithium batteries and lithium sulfur batteries, even those which use a lithium metal anode.

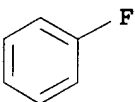
IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 462-06-6, Fluorobenzene 646-06-0, 1,3-Dioxolane 1072-47-5, 4-Methyl-1,3-dioxolane 1072-57-7, 1,3-Dioxolane, 4,5-dimethyl- 29921-38-8, 4-Ethyl-1,3-dioxolane 676610-04-1  
 RL: DEV (Device component use); USES (Uses)  
 (organic electrolytic solution for lithium battery)  
 RN 96-49-1 HCAPLUS  
 CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



RN 108-32-7 HCAPLUS  
 CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



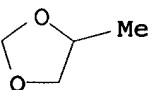
RN 462-06-6 HCAPLUS  
 CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 646-06-0 HCAPLUS  
 CN 1,3-Dioxolane (6CI, 8CI, 9CI) (CA INDEX NAME)

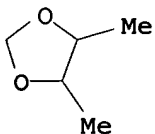


RN 1072-47-5 HCAPLUS  
 CN 1,3-Dioxolane, 4-methyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



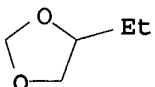
RN 1072-57-7 HCAPLUS

CN 1,3-Dioxolane, 4,5-dimethyl- (7CI, 8CI, 9CI) (CA INDEX NAME)



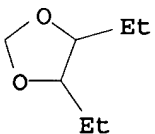
RN 29921-38-8 HCAPLUS

CN 1,3-Dioxolane, 4-ethyl- (8CI, 9CI) (CA INDEX NAME)



RN 676610-04-1 HCAPLUS

CN 1,3-Dioxolane, 4,5-diethyl- (9CI) (CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium battery org **electrolyte**

IT Secondary batteries

(lithium; organic **electrolytic** solution for lithium battery)

IT Battery **electrolytes**

(organic **electrolytic** solution for lithium battery)

IT Carbonaceous materials (technological products)

Polyoxyalkylenes, uses

RL: DEV (Device component use); USES (Uses)

(organic **electrolytic** solution for lithium battery)

IT Lithium alloy, base

RL: DEV (Device component use); USES (Uses)

(organic **electrolytic** solution for lithium battery)

IT 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate

105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate

110-71-4 111-96-6, Diglyme 112-36-7, Diethylene glycol diethyl

**ether** 112-49-2, Triethylene glycol dimethyl **ether**

321-28-8 456-49-5 459-60-9 462-06-6, Fluorobenzene

616-38-6, DiMethyl carbonate 623-53-0, Ethyl methyl carbonate

646-06-0, 1,3-Dioxolane 872-36-6, Vinylene carbonate

1072-47-5, 4-Methyl-1,3-dioxolane 1072-57-7,

1,3-Dioxolane, 4,5-dimethyl- 4499-99-4, Triethylene glycol diethyl

**ether** 7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses

7782-42-5, Graphite, uses 14315-97-0, 1,1,3-Trimethoxypropane

25322-68-3, Peo 29921-38-8, 4-Ethyl-1,3-dioxolane

73506-93-1, Diethoxyethane 74432-42-1, Lithium polysulfide

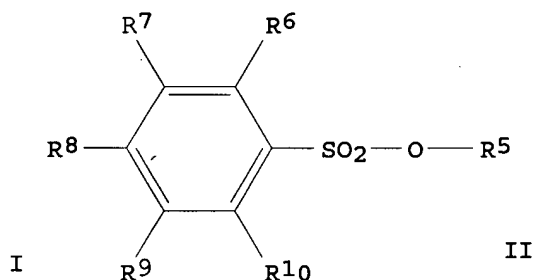
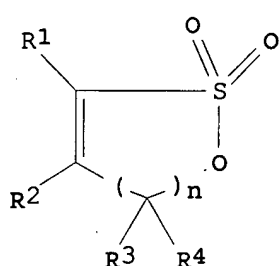
90076-65-6 676610-04-1

RL: DEV (Device component use); USES (Uses)

(organic **electrolytic** solution for lithium battery)

L56 ANSWER 15 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2004:219300 HCAPLUS  
 DOCUMENT NUMBER: 140:256257  
 TITLE: Nonaqueous **electrolyte** solution and  
 secondary lithium battery using the solution  
 INVENTOR(S): Hinohara, Akio; Hayashi, Takeshi  
 PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 21 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2004087168	A2	20040318	JP 2002-243094	200208 23
			<--	
PRIORITY APPLN. INFO.:			JP 2002-243094	200208 23
			<--	
OTHER SOURCE(S):		MARPAT 140:256257		
GI				

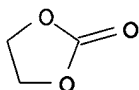


AB The **electrolyte** solution contains  $\geq 1$  chlorinated aromatic compound selected from chlorinated biphenyl, chlorinated naphthalene, chlorinated fluorene, and chlorinated diphenylmethane; a sulfonyl group containing compound, other nonaq. **solvent**, and a Li containing **electrolyte**. The sulfonyl group containing compound is selected from I [R<sub>1</sub>-4 = H, halogen, or C1-12 (halogenated) alkyl groups, n = integer 0-3], II [R<sub>5</sub>-10 = H, Li, halogen, sulfonate **ester** group, carbonate **ester** group, Li sulfonate group, or C1-12 (halogenated) alkyl group], and sulfonamides.

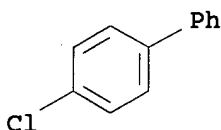
IT 96-49-1, Ethylene carbonate 2051-62-9,  
 4-Chlorobiphenyl

RL: DEV (Device component use); USES (Uses)  
 (electrolyte solns. containing chlorinated aromatic compds.  
 and sulfonyl group containing compds. for secondary lithium  
 batteries)

RN 96-49-1 HCAPLUS  
CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



RN 2051-62-9 HCAPLUS  
CN 1,1'-Biphenyl, 4-chloro- (9CI) (CA INDEX NAME)



IC ICM H01M010-40  
ICS H01M002-34; H01M004-02; H01M004-58; H01M006-16; H01M010-48  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST sultone secondary lithium battery **electrolyte** soln;  
sulfonate secondary lithium battery **electrolyte** soln;  
sulfonamide secondary lithium battery **electrolyte** soln;  
chlorinated arom compd secondary lithium battery **electrolyte** soln  
IT Battery **electrolytes**  
(**electrolyte** solns. containing chlorinated aromatic compds. and sulfonyl group containing compds. for secondary lithium batteries)  
IT 96-49-1, Ethylene carbonate 623-53-0, Methyl ethyl carbonate 872-36-6, Vinylene carbonate 1120-71-4, 1,3-Propanesultone 2051-62-9, 4-Chlorobiphenyl 21324-40-3, Lithium hexafluorophosphate 21806-61-1  
RL: DEV (Device component use); USES (Uses)  
(**electrolyte** solns. containing chlorinated aromatic compds. and sulfonyl group containing compds. for secondary lithium batteries)

L56 ANSWER 16 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2004:203431 HCAPLUS  
DOCUMENT NUMBER: 140:238483  
TITLE: **Electrolyte** for a lithium battery  
INVENTOR(S): Park, Yong-Chul; Jung, Won-Ii; Kim, Geun-Bae; Cho, Jae-Phil; Jung, Cheol-Soo  
PATENT ASSIGNEE(S): S. Korea  
SOURCE: U.S. Pat. Appl. Publ., 13 pp.  
CODEN: USXXCO  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004048163	A1	20040311	US 2003-656086	200309

05

KR 2004022054                  A                  20040311                  KR 2002-53879

200209  
06

JP 2004103573                  A2                  20040402                  JP 2003-282119

200307  
29

CN 1495961                  A                  20040512                  CN 2003-164853

200309  
06

PRIORITY APPLN. INFO.:

KR 2002-53879

A

200209  
06

OTHER SOURCE(S) : MARPAT 140:238483

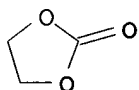
AB An **electrolyte** for a lithium battery includes a nonaq. organic **solvent**, a lithium salt, and an additive comprising (a) a sulfone-based compound and (b) a C3-30 organic peroxide or azo-based compound. The **electrolyte** may further include a poly(**ester**) (meth)acrylate or a polymer that is derived from a (polyester)polyol with at least three hydroxyl (-OH) groups, where a portion or all of the hydroxyl groups are substituted with a (meth)acrylic **ester** and the remaining hydroxyl groups that are not substituted with the (meth)acrylic **ester** are substituted with a group having no radical reactivity. The lithium battery comprising the **electrolyte** of the present invention has a significantly improved charge-discharge and cycle life characteristics, recovery capacity ratio at high temperature, and swelling inhibition properties.

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 108-90-7, Chlorobenzene, uses 462-06-6, Fluorobenzene 4437-85-8, Butylene carbonate 27359-10-0, Trifluorotoluene

RL: DEV (Device component use); USES (Uses)  
(electrolyte for lithium battery)

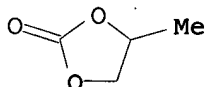
RN 96-49-1 HCAPLUS

CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



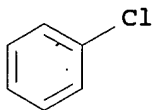
RN 108-32-7 HCAPLUS

CN	1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)
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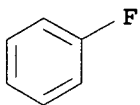


RN 108-90-7 HCAPLUS

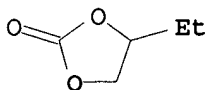
CN Benzene, chloro- (8CI, 9CI) (CA INDEX NAME)



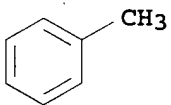
RN 462-06-6 HCAPLUS  
 CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 4437-85-8 HCAPLUS  
 CN 1,3-Dioxolan-2-one, 4-ethyl- (9CI) (CA INDEX NAME)



RN 27359-10-0 HCAPLUS  
 CN Benzene, methyl-, trifluoro deriv. (9CI) (CA INDEX NAME)



### 3 (D1-F)

IC ICM H01M010-40  
 INCL 429326000; 429329000; 429339000; 429340000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 38  
 ST lithium battery **electrolyte**  
 IT Battery **electrolytes**  
     (**electrolyte** for lithium battery)  
 IT Aromatic hydrocarbons, uses  
     Carbonates, uses  
     **Esters**, uses  
     **Ethers**, uses  
     **Ketones**, uses  
 RL: DEV (Device component use); USES (Uses)  
     (**electrolyte** for lithium battery)  
 IT Azo compounds  
 RL: MOA (Modifier or additive use); USES (Uses)  
     (**electrolyte** for lithium battery)  
 IT Carbonaceous materials (technological products)  
 RL: MOA (Modifier or additive use); USES (Uses)  
     (**electrolyte** for lithium battery)  
 IT Sulfones

- RL: MOA (Modifier or additive use); USES (Uses)  
(**electrolyte** for lithium battery)
- IT Polyesters, uses  
RL: DEV (Device component use); USES (Uses)  
(hydroxy-terminated; **electrolyte** for lithium battery)
- IT Secondary batteries  
(lithium; **electrolyte** for lithium battery)
- IT Polyesters, uses  
RL: DEV (Device component use); USES (Uses)  
(methacrylate; **electrolyte** for lithium battery)
- IT Peroxides, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(organic, C3-30; **electrolyte** for lithium battery)
- IT **Esters**, uses  
RL: DEV (Device component use); USES (Uses)  
(poly-; **electrolyte** for lithium battery)
- IT Imides  
Sulfonic acids, uses  
RL: DEV (Device component use); USES (Uses)  
(sulfonimides, perfluoro derivs., lithium salts;  
**electrolyte** for lithium battery)
- IT 56-81-5, Glycerol, uses 71-43-2, Benzene, uses 96-49-1,  
Ethylene carbonate 98-95-3, Nitrobenzene, uses 105-58-8, Diethyl  
carbonate 108-32-7, Propylene carbonate 108-88-3,  
Toluene, uses 108-90-7, Chlorobenzene, uses 149-32-6,  
Erythritol 462-06-6, Fluorobenzene 616-38-6, Dimethyl  
carbonate 623-53-0, Methylethyl carbonate 623-96-1, Dipropyl  
carbonate 1330-20-7, Xylene, uses 4437-85-8, Butylene  
carbonate 7790-99-0, Iodine chloride (ICl) 7791-03-9, Lithium  
perchlorate 10377-51-2, Lithium iodide (LiI) 14024-11-4, Lithium  
tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate  
18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium  
hexafluorophosphate 27359-10-0, Trifluorotoluene  
29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium  
triflate 35363-40-7, Ethyl propyl carbonate 39300-70-4, Lithium  
nickel oxide 56525-42-9, Methyl propyl carbonate 90076-65-6  
131651-65-5, Lithium nonafluorobutanesulfonate 162684-16-4,  
Lithium manganese nickel oxide 193215-00-8, Cobalt  
lithiummanganese nickel oxide Co0.1LiMn0.2Ni0.7O2  
RL: DEV (Device component use); USES (Uses)  
(**electrolyte** for lithium battery)
- IT 67-71-0, Methyl sulfone 77-77-0, Vinyl sulfone 78-67-1,  
2,2'-Azobisisobutyronitrile 94-36-0, Benzoyl peroxide, uses  
105-64-6, Diisopropyl peroxy dicarbonate 105-74-8, Lauroyl  
peroxide 126-33-0, Tetramethylene sulfone 127-63-9, Phenyl  
sulfone 620-32-6, Benzyl sulfone 1561-49-5, Dicyclohexylperoxy  
dicarbonate 1712-87-4, m-Toluoyl peroxide 3006-82-4,  
tert-Butylperoxy-2-ethyl hexanoate 14666-78-5 15520-11-3,  
Bis(4-tert-butylcyclohexyl)peroxy dicarbonate 26748-41-4  
28452-93-9, Butadiene sulfone 32752-09-3, Isobutyl peroxide  
92177-99-6, 3,3,5-Trimethylhexanoyl peroxide  
RL: MOA (Modifier or additive use); USES (Uses)  
(**electrolyte** for lithium battery)
- IT 79-10-7DP, Acrylic acid, reaction product with dipentaerythritol and  
ε-caprolactone and butylcarbonic acid 126-58-9DP,  
Dipentaerythritol, reaction product with ε-caprolactone and  
acrylic acid and butylcarbonic acid 502-44-3DP,  
ε-Caprolactone, reaction product with dipentaerythritol and  
acrylic acid and butylcarbonic acid 10411-26-4DP,  
MonoButylcarbonate, reaction product with dipentaerythritol and

ε-caprolactone and acrylic acid  
 RL: MOA (Modifier or additive use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (electrolyte for lithium battery)

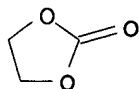
L56 ANSWER 17 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2004:182343 HCAPLUS  
 DOCUMENT NUMBER: 140:202488  
 TITLE: Polymer **electrolyte** for lithium  
 secondary battery with improved safety and  
 reduced swelling  
 INVENTOR(S): Lee, Yong-beom  
 PATENT ASSIGNEE(S): Samsung Sdi Co.,ltd., S. Korea  
 SOURCE: U.S. Pat. Appl. Publ., 8 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004043298	A1	20040304	US 2003-440245	20030519
KR 2004020631	A	20040309	KR 2002-52280	20020831
CN 1479401	A	20040303	CN 2003-152463	20030704
PRIORITY APPLN. INFO.:			KR 2002-52280	A 20020831

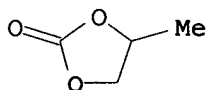
AB The invention concerns a polymer **electrolyte** that extends the cycle life, improves the safety, and reduces the swelling of a battery, compared with a polymer **electrolyte** containing a poly(alkylene oxide) polymer. Also, a lithium battery utilizes the polymer **electrolyte**. The polymer **electrolyte** contains a polymerized product from a polymer **electrolyte** forming composition containing a multifunctional isocyanurate monomer of a particular structure, a lithium salt, and a nonaq. organic solvent.

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 462-06-6, Fluorobenzene 27858-05-5, DiFluorobenzene  
 RL: DEV (Device component use); USES (Uses)  
 (polymer **electrolyte** for lithium secondary battery with improved safety and reduced swelling)

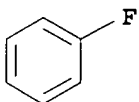
RN 96-49-1 HCAPLUS  
 CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



RN 108-32-7 HCAPLUS  
CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



RN 462-06-6 HCAPLUS  
CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 27858-05-5 HCAPLUS  
CN Benzene, difluoro- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



2 ( D1-F )

IC ICM H01M006-18

INCL 429323000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 38

ST polymer **electrolyte** lithium secondary battery improved  
safety reduced swelling

IT Peroxides, processes

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

(acyl, polymerization initiator; polymer **electrolyte** for lithium secondary battery with improved safety and reduced swelling)

IT Peroxides, processes

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

(alkyl, polymerization initiator; polymer **electrolyte** for lithium secondary battery with improved safety and reduced swelling)

IT Hydroperoxides

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

- (alkyl, tertiary, polymerization initiator; polymer **electrolyte** for lithium secondary battery with improved safety and reduced swelling)
- IT Secondary batteries  
(lithium; polymer **electrolyte** for lithium secondary battery with improved safety and reduced swelling)
- IT **Esters**, processes  
Ketals  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)  
(peroxy, polymerization initiator; polymer **electrolyte** for lithium secondary battery with improved safety and reduced swelling)
- IT Carbonates, processes  
Peroxides, processes  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)  
(peroxycarbonates, polymerization initiator; polymer **electrolyte** for lithium secondary battery with improved safety and reduced swelling)
- IT Battery **electrolytes**  
Polymerization catalysts  
Safety  
Swelling, physical  
(polymer **electrolyte** for lithium secondary battery with improved safety and reduced swelling)
- IT Carbon fibers, uses  
Carbonaceous materials (technological products)  
RL: DEV (Device component use); USES (Uses)  
(polymer **electrolyte** for lithium secondary battery with improved safety and reduced swelling)
- IT Azo compounds  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)  
(polymerization initiator; polymer **electrolyte** for lithium secondary battery with improved safety and reduced swelling)
- IT Lithium alloy, base  
RL: DEV (Device component use); USES (Uses)  
(polymer **electrolyte** for lithium secondary battery with improved safety and reduced swelling)
- IT 96-47-9, 2-Methyltetrahydrofuran 96-48-0,  $\gamma$ -Butyrolactone  
96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
107-31-3, Methyl formate 108-32-7, Propylene carbonate  
109-94-4, Ethyl formate 109-99-9, Thf, uses 112-49-2, Triglyme  
143-24-8, Tetraglyme 462-06-6, Fluorobenzene 616-38-6,  
Dimethyl carbonate 4824-75-3, Butylmethyl carbonate 7439-93-2,  
Lithium, uses 7704-34-9, Sulfur, uses 7704-34-9D, Sulfur,  
compds. 7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate  
12190-79-3, Cobalt lithium oxide colio2 14283-07-9, Lithium  
tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate  
27858-05-5, DiFluorobenzene 29935-35-1, Lithium  
hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7,  
Ethyl propylcarbonate 39300-70-4, Lithium nickel oxide  
39457-42-6, Lithium manganese oxide 51177-06-1, Chromium lithium  
oxide 52627-24-4, Cobalt lithium oxide 56525-42-9, Methyl  
propylcarbonate 73506-93-1, Diethoxyethane 90076-65-6  
131651-65-5 132843-44-8 654675-99-7, Lithium boride fluoride  
libf6  
RL: DEV (Device component use); USES (Uses)  
(polymer **electrolyte** for lithium secondary battery with

improved safety and reduced swelling)  
 IT 42033-33-0P, Tris(2-acryloyloxy)ethyl isocyanurate homopolymer  
 90802-77-0P 93295-01-3P  
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (polymer **electrolyte** for lithium secondary battery with  
 improved safety and reduced swelling)  
 IT 15520-11-3, Di(4-tert-butylcyclohexyl)peroxy dicarbonate  
 34099-48-4, Peroxydicarbonate  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
 process); PROC (Process)  
 (polymerization initiator; polymer **electrolyte** for lithium  
 secondary battery with improved safety and reduced swelling)

L56 ANSWER 18 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:159908 HCAPLUS

DOCUMENT NUMBER: 140:184751

TITLE: Secondary lithium battery nonaqueous

**electrolytes** and secondary lithium  
 batteries with prevented overcharging

INVENTOR(S): Shizuka, Kenji; Kinoshita, Shinichi; Noda,  
 Daisuke

PATENT ASSIGNEE(S): Mitsubishi Chemical Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2004063114	A2	20040226	JP 2002-216090	200207 25

PRIORITY APPLN. INFO.:

JP 2002-216090

200207  
25

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OTHER SOURCE(S): MARPAT 140:184751

AB Li salt-containing nonaq. **electrolytes** also containing  
 overcharging inhibitors and (di)sulfides are claimed. Preferable  
 structure for the the overcharging inhibitor is C6R1R2R3R4R5R6 (R1-6  
 = H, halogen, (un)substituted hydrocarbon, alkoxy, aryloxy; R1 + R2  
 may form (un)substituted, phenyleneoxy, ethyleneoxy,  
 trimethyleneoxy, propenyleneoxy, vinyleneoxy). Preferable  
 overcharging inhibitors and (di)sulfides are also given.

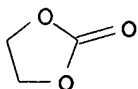
IT 96-49-1, Ethylene carbonate

RL: DEV (Device component use); TEM (Technical or engineered  
 material use); USES (Uses)

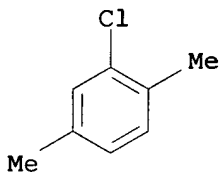
(**electrolyte solvent**; lithium secondary  
 batteries with nonaq. **electrolytes** containing overcharging  
 inhibitors and disulfides)

RN 96-49-1 HCAPLUS

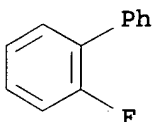
CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



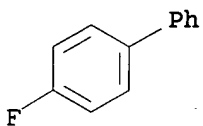
IT 95-72-7, 2-Chloro-p-xylene 321-60-8,  
 2-Fluorobiphenyl 324-74-3, 4-Fluorobiphenyl  
 392-69-8, 2-Fluoromesitylene 396-64-5,  
 3,3'-Difluorobiphenyl 398-23-2, 4,4'-Difluorobiphenyl  
 583-70-0, 4-Bromo-m-xylene 615-60-1,  
 4-Chloro-o-xylene  
 RL: DEV (Device component use); MOA (Modifier or additive use); TEM  
 (Technical or engineered material use); USES (Uses)  
 (overcharging inhibitor; lithium secondary batteries with nonaq.  
 electrolytes containing overcharging inhibitors and  
 disulfides)  
 RN 95-72-7 HCAPLUS  
 CN Benzene, 2-chloro-1,4-dimethyl- (9CI) (CA INDEX NAME)



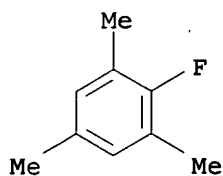
RN 321-60-8 HCAPLUS  
 CN 1,1'-Biphenyl, 2-fluoro- (9CI) (CA INDEX NAME)



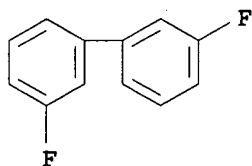
RN 324-74-3 HCAPLUS  
 CN 1,1'-Biphenyl, 4-fluoro- (9CI) (CA INDEX NAME)



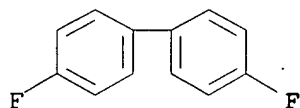
RN 392-69-8 HCAPLUS  
 CN Benzene, 2-fluoro-1,3,5-trimethyl- (9CI) (CA INDEX NAME)



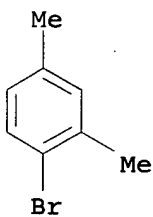
RN 396-64-5 HCAPLUS  
CN 1,1'-Biphenyl, 3,3'-difluoro- (9CI) (CA INDEX NAME)



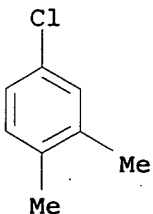
RN 398-23-2 HCAPLUS  
CN 1,1'-Biphenyl, 4,4'-difluoro- (9CI) (CA INDEX NAME)



RN 583-70-0 HCAPLUS  
CN Benzene, 1-bromo-2,4-dimethyl- (9CI) (CA INDEX NAME)



RN 615-60-1 HCAPLUS  
CN Benzene, 4-chloro-1,2-dimethyl- (9CI) (CA INDEX NAME)



IC ICM H01M010-40

MEI HUANG EIC1700 REM4B28 571-272-3952

18/12/2006

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 25, 27

ST nonaq **electrolyte** lithium secondary battery; overcharging  
inhibitor lithium secondary battery **electrolyte**; disulfide  
additive lithium secondary battery **electrolyte**

IT Disulfides  
RL: DEV (Device component use); MOA (Modifier or additive use); TEM  
(Technical or engineered material use); USES (Uses)  
(**electrolytes** containing; lithium secondary batteries with  
nonaq. **electrolytes** containing overcharging inhibitors and  
disulfides)

IT Battery **electrolytes**  
(lithium secondary batteries with nonaq. **electrolytes**  
containing overcharging inhibitors and disulfides)

IT Secondary batteries  
(lithium; lithium secondary batteries with nonaq.  
**electrolytes** containing overcharging inhibitors and  
disulfides)

IT 21324-40-3, Lithium hexafluorophosphate (LiPF<sub>6</sub>)  
RL: DEV (Device component use); TEM (Technical or engineered  
material use); USES (Uses)  
(**electrolyte** salt; lithium secondary batteries with  
nonaq. **electrolytes** containing overcharging inhibitors and  
disulfides)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
872-36-6, Vinylene carbonate  
RL: DEV (Device component use); TEM (Technical or engineered  
material use); USES (Uses)  
(**electrolyte solvent**; lithium secondary  
batteries with nonaq. **electrolytes** containing overcharging  
inhibitors and disulfides)

IT 2127-03-9, 2,2'-Dipyridyl disulfide 2127-10-8,  
2,2'-Dithiobis(5-nitropyridine) 2645-22-9, 4,4'-Dipyridyl  
disulfide 15658-35-2, 6,6'-Dithiodinicotinic acid  
RL: DEV (Device component use); MOA (Modifier or additive use); TEM  
(Technical or engineered material use); USES (Uses)  
(**electrolytes** containing; lithium secondary batteries with  
nonaq. **electrolytes** containing overcharging inhibitors and  
disulfides)

IT 92-52-4, Biphenyl, uses 95-72-7, 2-Chloro-p-xylene  
101-81-5, Diphenylmethane 101-84-8, Diphenyl ether  
103-29-7, 1,2-Diphenylethane 104-66-5, 1,2-Diphenoxyethane  
104-92-7, 4-Bromoanisole 132-64-9, Dibenzofuran 321-60-8  
, 2-Fluorobiphenyl 324-74-3, 4-Fluorobiphenyl 362-56-1,  
1,2,4,5-Tetrafluoro-3,6-dimethoxybenzene 392-69-8,  
2-Fluoromesitylene 396-64-5, 3,3'-Difluorobiphenyl  
398-23-2, 4,4'-Difluorobiphenyl 452-10-8,  
2,4-Difluoroanisole 456-49-5, 3-Fluoroanisole 459-60-9,  
4-Fluoroanisole 583-70-0, 4-Bromo-m-xylene 612-75-9,  
3,3'-Dimethylbiphenyl 613-33-2, 4,4'-Dimethylbiphenyl  
615-60-1, 4-Chloro-o-xylene 623-12-1, 4-Chloroanisole  
643-58-3, 2-Methylbiphenyl 643-93-6, 3-Methylbiphenyl 644-08-6,  
4-Methylbiphenyl 766-51-8, 2-Chloroanisole 778-22-3,  
2,2-Diphenylpropane 827-52-1, Cyclohexylbenzene 1625-92-9,  
4-tert-Butylbiphenyl 1667-08-9 1973-15-5, 3-Cyclohexylbiphenyl  
2845-89-8, 3-Chloroanisole 3061-36-7, 1,4-Diphenoxybenzene  
3150-40-1, 2,3,5,6-Tetrafluoro-4-methylanisole 3379-38-2,  
1,3-Diphenoxybenzene 4016-06-2, 1,3-Dicyclohexylbenzene  
6738-04-1, 2-Phenoxybiphenyl 7051-16-3, 1,3-Dimethoxy-5-  
chlorobenzene 17715-69-4, 1,3-Dimethoxy-4-bromobenzene

20273-26-1 25245-34-5 26140-60-3, Terphenyl 52189-63-6,  
1-Fluoro-3,5-dimethoxybenzene 82830-49-7, 1,4-Dimethoxy-2-  
fluorobenzene 93343-10-3, 3,5-Difluoroanisole 97762-38-4  
258268-48-3

RL: DEV (Device component use); MOA (Modifier or additive use); TEM  
(Technical or engineered material use); USES (Uses)  
(overcharging inhibitor; lithium secondary batteries with nonaq.  
**electrolytes** containing overcharging inhibitors and  
disulfides)

L56 ANSWER 19 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:119843 HCAPLUS

DOCUMENT NUMBER: 140:149224

TITLE: Nonaqueous **electrolytic** solution with  
improved safety for lithium battery

INVENTOR(S): Kim, Jun-ho; Lee, Ha-young; Choy, Sang-hoon;  
Kim, Ho-sung

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea

SOURCE: U.S. Pat. Appl. Publ., 12 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

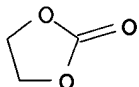
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004029018	A1	20040212	US 2003-637554	200308 11
US 7105250	B2	20060912		
KR 2004015420	A	20040219	KR 2002-47510	200208 12
JP 2004079532	A2	20040311	JP 2003-290946	200308 08
CN 1495960	A	20040512	CN 2003-158672	200308 12
PRIORITY APPLN. INFO.:			KR 2002-47510	A 200208 12

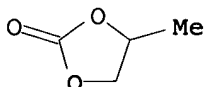
AB A nonaq. **electrolytic** solution and a lithium battery  
employing the same include a lithium salt, an organic **solvent**  
, and a halogenated benzene compound. The use of the nonaq.  
**electrolytic** solution causes formation of a polymer by  
oxidative decomposition of the **electrolytic** solution even if a  
sharp voltage increase occurs due to overcharging of the battery,  
leading to consumption of an overcharge current, thus protecting the  
battery.

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene  
carbonate 462-06-6, Fluorobenzene  
RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. **electrolytic** solution with improved safety for

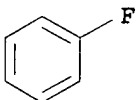
lithium battery)  
 RN 96-49-1 HCAPLUS  
 CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



RN 108-32-7 HCAPLUS  
 CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



RN 462-06-6 HCAPLUS  
 CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40  
 INCL 429326000; 429200000; 429340000; 429331000; 429332000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST lithium battery nonaq electrolyte soln improved safety  
 IT **Esters**, uses  
     **Ethers**, uses  
     Hydrocarbons, uses  
     RL: MOA (Modifier or additive use); USES (Uses)  
         (C1-20; nonaq. **electrolytic** solution with improved safety  
         for lithium battery)  
 IT Aromatic hydrocarbons, uses  
     RL: MOA (Modifier or additive use); USES (Uses)  
         (C5-20; nonaq. **electrolytic** solution with improved safety  
         for lithium battery)  
 IT Secondary batteries  
     (lithium; nonaq. **electrolytic** solution with improved  
     safety for lithium battery)  
 IT Battery **electrolytes**  
     (nonaq. **electrolytic** solution with improved safety for  
     lithium battery)  
 IT Polyesters, uses  
     RL: MOA (Modifier or additive use); USES (Uses)  
         (nonaq. **electrolytic** solution with improved safety for  
         lithium battery)  
 IT Alcohols, uses  
     RL: MOA (Modifier or additive use); USES (Uses)  
         (polyhydric; nonaq. **electrolytic** solution with improved  
         safety for lithium battery)  
 IT 3087-37-4, Tetrapropyltitanate  
     RL: CAT (Catalyst use); USES (Uses)  
         (nonaq. **electrolytic** solution with improved safety for

lithium battery)

IT 502-44-3,  $\epsilon$ -Caprolactone 7439-93-2D, Lithium, salt  
12190-79-3, Cobalt lithium oxide colio2  
RL: DEV (Device component use); USES (Uses)  
(nonaq. **electrolytic** solution with improved safety for  
lithium battery)

IT 126-58-9DP, Dipentaerythritol, derivative  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(nonaq. **electrolytic** solution with improved safety for  
lithium battery)

IT 56-81-5, Glycerol, uses 67-71-0, Methyl sulfone 71-43-2D,  
Benzene, halogenated 77-77-0, Vinyl sulfone 94-36-0,  
Benzoylperoxide, uses 96-49-1, Ethylene carbonate  
105-64-6, Diisopropyl peroxy dicarbonate 105-74-8, Lauroyl  
peroxide 108-32-7, Propylene carbonate 115-77-5,  
Pentaerythritol, uses 126-33-0, Tetramethylene sulfone 126-58-9,  
DiPentaerythritol 127-63-9, Phenyl sulfone 456-55-3,  
Trifluoromethyl phenyl **ether** 462-06-6,  
Fluorobenzene 620-32-6, Benzyl sulfone 623-53-0, Ethyl methyl  
carbonate 1561-49-5, Dicyclohexyl peroxy dicarbonate 1712-87-4,  
m-Toluoyl peroxide 2972-19-2 3006-82-4, tert-Butylperoxy-2-  
ethylhexanoate 9002-88-4, Polyethylene 9003-07-0, Polypropylene  
14666-78-5 15520-11-3, Bis(4-tert-butylcyclohexyl)  
peroxydicarbonate 21151-56-4, Benzene, 1-chloro-4-(chloromethoxy)-  
21324-40-3, Lithium hexafluorophosphate 28452-93-9, Butadiene  
sulfone 32752-09-3, Isobutyl peroxide 49717-97-7, 2-Propenoic  
acid, 2-methyl-, ion(1-) homopolymer, uses 92177-99-6,  
3,3,5-Trimethylhexanoylperoxide 651294-25-6 651294-26-7  
651294-27-8  
RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. **electrolytic** solution with improved safety for  
lithium battery)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

L56 ANSWER 20 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:910398 HCAPLUS

DOCUMENT NUMBER: 139:398017

TITLE: Nonaqueous **electrolyte** secondary  
battery having high capacity and excellent  
storage property, loading characteristic and  
cycle property

INVENTOR(S): Kotado, Minoru; Suzuki, Hitoshi

PATENT ASSIGNEE(S): Mitsubishi Chemical Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003331915	A2	20031121	JP 2002-141142	200205 16

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PRIORITY APPLN. INFO.:

JP 2002-141142

200205

16

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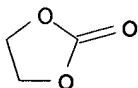
AB In nonaq. **electrolyte** secondary battery comprising Li-occluding and releasing anode, cathode, and **electrolyte** obtained by dissolving Li salt in a nonaq. **solvent**, wherein the nonaq. **solvent** contains  $\geq 1$  of unsatd. bond-containing cyclic carbonic **esters** and acid anhydrides, S-containing organic compound, and  $\geq 1$  of C $\leq 9$  F-containing aromatic compds., aliphatic hydrocarbons, and F-containing aliphatic hydrocarbon compds. The nonaq. **electrolyte** secondary battery has high capacity even after storage.

IT 96-49-1, Ethylene carbonate 462-06-6, Fluorobenzene

RL: TEM (Technical or engineered material use); USES (Uses)  
(nonaq. **electrolyte** containing; nonaq. **electrolyte** secondary battery having high capacity and excellent storage property, loading characteristic and cycle property)

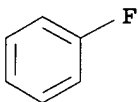
RN 96-49-1 HCAPLUS

CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



RN 462-06-6 HCAPLUS

CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq **electrolyte** secondary battery capacity storage stability

IT Anhydrides

Hydrocarbons, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(nonaq. **electrolyte** containing; nonaq. **electrolyte** secondary battery having high capacity and excellent storage property, loading characteristic and cycle property)

IT Secondary batteries

(nonaq. **electrolyte** secondary battery having high capacity and excellent storage property, loading characteristic and cycle property)

IT 96-49-1, Ethylene carbonate 126-33-0, Sulfolane

142-82-5, Heptane, uses 462-06-6, Fluorobenzene

623-53-0, Ethyl methyl carbonate 872-36-6, Vinylene carbonate

1120-71-4, 1,3-Propanesultone 14283-07-9, Lithium

tetrafluoroborate (LiBF<sub>4</sub>) 21324-40-3, Lithium hexafluorophosphate (LiPF<sub>6</sub>)

RL: TEM (Technical or engineered material use); USES (Uses)

(nonaq. **electrolyte** containing; nonaq. **electrolyte**

secondary battery having high capacity and excellent storage property, loading characteristic and cycle property)  
 IT 66-27-3, Methyl methanesulfonate  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (nonaq. **electrolyte** secondary battery having high capacity and excellent storage property, loading characteristic and cycle property)

L56 ANSWER 21 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:796195 HCAPLUS

DOCUMENT NUMBER: 139:294681

TITLE: **Electrolyte** for lithium battery to reduce overcharge and improve electrochemical characteristics

INVENTOR(S): Kim, Jun-Ho; Lee, Ha-Young; Choy, Sang-Hoon; Kim, Ho-Sung; Noh, Hyeong-Gon

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea

SOURCE: U.S. Pat. Appl. Publ., 19 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003190529	A1	20031009	US 2003-393294	20030321
KR 2003079310	A	20031010	KR 2002-18264	20020403
CN 1449070	A	20031015	CN 2003-108529	20030328
JP 2003297426	A2	20031017	JP 2003-100349	20030403
PRIORITY APPLN. INFO.:			KR 2002-18264	20020403

OTHER SOURCE(S): MARPAT 139:294681

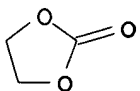
AB An **electrolyte** for a lithium battery includes a nonaq. organic **solvent**, a lithium salt, and an additive comprising (a) a compound represented by the formula [(R1)<sub>n</sub>C<sub>6</sub>H<sub>(6-n+m)</sub>(X)<sub>m</sub>], and (b) a compound selected from the group consisting of a sulfone-based compound, a poly(**ester**) (meth)acrylate, a polymer of poly(**ester**) (meth)acrylate, and a mixture thereof: wherein R1 is a C1-10 alkyl, a C 1-10 alkoxy, or a C6-10 aryl, and preferably a Me, Et, or methoxy, X is a halogen, and m and n are integers ranging from 1 to 5, where m+n is less than or equal to 6.

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 462-06-6, Fluorobenzene 4437-85-8, Butylene carbonate 27359-10-0, Trifluorotoluene

RL: DEV (Device component use); USES (Uses)  
 (electrolyte for lithium battery to reduce overcharge  
 and improve electrochem. characteristics)

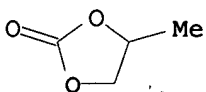
RN 96-49-1 HCAPLUS

CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



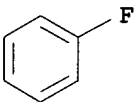
RN 108-32-7 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



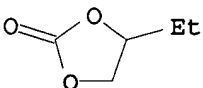
RN 462-06-6 HCAPLUS

CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



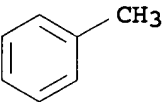
RN 4437-85-8 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-ethyl- (9CI) (CA INDEX NAME)



RN 27359-10-0 HCAPLUS

CN Benzene, methyl-, trifluoro deriv. (9CI) (CA INDEX NAME)



3 (D1-F)

IC ICM H01M006-18

INCL 429307000; 429309000; 429326000; 429322000; 429323000; 429330000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium battery electrolyte overcharge lowering

IT Battery electrolytes

(electrolyte for lithium battery to reduce overcharge)

- and improve electrochem. characteristics)
- IT Secondary batteries  
(lithium; **electrolyte** for lithium battery to reduce overcharge and improve electrochem. characteristics)
- IT Peroxides, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(organic; **electrolyte** for lithium battery to reduce overcharge and improve electrochem. characteristics)
- IT Alcohols, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(trihydric; **electrolyte** for lithium battery to reduce overcharge and improve electrochem. characteristics)
- IT 3087-37-4, Tetrapropyltitanate  
RL: CAT (Catalyst use); USES (Uses)  
(**electrolyte** for lithium battery to reduce overcharge and improve electrochem. characteristics)
- IT 71-43-2, Benzene, uses 96-49-1, Ethylene carbonate  
105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate  
108-88-3, Toluene, uses 462-06-6, Fluorobenzene  
616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate  
623-96-1, Dipropyl carbonate 1330-20-7, Xylene, uses  
4437-85-8, Butylene carbonate 7447-41-8, Lithium chloride  
(LiCl), uses 7791-03-9, Lithium perchlorate 10377-51-2, Lithium  
iodide (LiI) 12355-58-7, Lithium aluminate (Li5AlO4) 14283-07-9,  
Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate  
21324-40-3, Lithium hexafluorophosphate 27359-10-0,  
Trifluorotoluene 29935-35-1, Lithium hexafluoroarsenate  
33454-82-9, Lithium triflate 35363-40-7, Ethyl propyl carbonate  
56525-42-9, Methyl propyl carbonate 90076-65-6 131651-65-5,  
Lithium perfluorobutanesulfonate  
RL: DEV (Device component use); USES (Uses)  
(**electrolyte** for lithium battery to reduce overcharge and improve electrochem. characteristics)
- IT 126-58-9DP, Dipentaerythritol, reaction product with  
 $\epsilon$ -caprolactone 502-44-3DP,  $\epsilon$ -Caprolactone,  
reaction product with dipentaerythritol 609772-45-4P  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(**electrolyte** for lithium battery to reduce overcharge and improve electrochem. characteristics)
- IT 56-81-5, Glycerol, uses 67-71-0, Methyl sulfone 77-77-0, Vinyl  
sulfone 79-10-7D, Acrylic acid,  $\omega$ -fatty acid **esters**  
C2-C21 79-41-4D, Methacrylic acid,  $\omega$ -fatty acid  
**esters** C2-C21 94-36-0, Benzoyl peroxide, uses 104-92-7,  
4-Bromoanisole 105-64-6, Diisopropyl peroxy dicarbonate  
105-74-8, Lauroyl peroxide 126-33-0, Tetramethylene sulfone  
127-63-9, Phenyl sulfone 149-32-6, Erythritol 452-10-8,  
2,4-Difluoroanisole 456-49-5, 3-Fluoroanisole 459-60-9,  
4-Fluoroanisole 620-32-6, Benzyl sulfone 623-12-1,  
4-Chloroanisole 1561-49-5, Dicyclohexyl peroxy dicarbonate  
1712-87-4, m-Toluoyle peroxide 2398-37-0, 3-Bromoanisole  
2845-89-8, 3-Chloroanisole 3006-82-4, tert-Butylperoxy-2-ethyl-  
hexanoate 14666-78-5 15520-11-3, Bis(4-tert-  
butylcyclohexyl)peroxy dicarbonate 28452-93-9, Butadiene sulfone  
32752-09-3, Isobutyl peroxide 92177-99-6, 3,3,5-Trimethylhexanoyl  
peroxide 93343-10-3, 3,5-Difluoroanisole 202925-08-4,  
3-Chloro-5-fluoroanisole 609365-67-5  
RL: MOA (Modifier or additive use); USES (Uses)  
(**electrolyte** for lithium battery to reduce overcharge and improve electrochem. characteristics)

L56 ANSWER 22 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:656287 HCAPLUS

DOCUMENT NUMBER: 139:182872

TITLE: Polymer **electrolyte** for lithium  
secondary batteryINVENTOR(S): Jung, Cheol-Soo; Kim, Ki-Ho; Bong, Cul-Hwen;  
Yang, Doo-Kyung; Lee, Kyoung-Hee; Lee,  
Yong-Beom; Lim, Hyun-Leong; Yamaguchi, Takitaro;  
Shimizu, Ryuichi

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea

SOURCE: U.S. Pat. Appl. Publ., 14 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

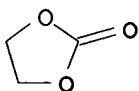
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 2003157411	A1	20030821	US 2002-287486	200211 05
			<--	
KR 2003068714	A	20030825	KR 2002-8303	200202 16
			<--	
JP 2003249264	A2	20030905	JP 2003-31544	200302 07
			<--	
CN 1438727	A	20030827	CN 2003-103890	200302 14
			<--	
PRIORITY APPLN. INFO.:			KR 2002-8303	A 200202 16

AB A solid polymer **electrolyte**, a lithium battery employing the same, and methods of forming the **electrolyte** and the lithium battery are disclosed. The polymer **electrolyte** includes polyester methacrylate having a polyester polyol moiety having three or more hydroxide (-OH) groups, at least one hydroxide group being substituted by a methacrylic **ester** group and at least one hydroxide group being substituted by a radical non-reactive group, or its polymer, a peroxide having 6-40 carbon atoms, and an **electrolytic** solution including a lithium salt and an organic **solvent**.

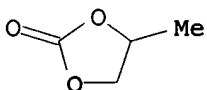
IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 108-90-7, Chlorobenzene, uses 646-06-0, Dioxolane 1072-47-5, 1,3-Dioxolane, 4-methyl 4437-85-8, Butylene carbonate  
RL: DEV (Device component use); USES (Uses)  
(polymer **electrolyte** for lithium secondary battery)

RN 96-49-1 HCAPLUS

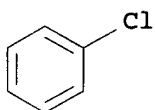
CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



RN 108-32-7 HCAPLUS  
CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



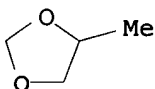
RN 108-90-7 HCAPLUS  
CN Benzene, chloro- (8CI, 9CI) (CA INDEX NAME)



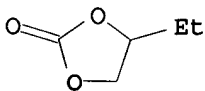
RN 646-06-0 HCAPLUS  
CN 1,3-Dioxolane (6CI, 8CI, 9CI) (CA INDEX NAME)



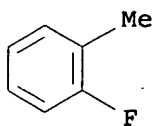
RN 1072-47-5 HCAPLUS  
CN 1,3-Dioxolane, 4-methyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



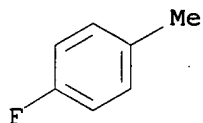
RN 4437-85-8 HCAPLUS  
CN 1,3-Dioxolan-2-one, 4-ethyl- (9CI) (CA INDEX NAME)



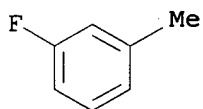
IT 95-52-3, 2-Fluorotoluene 352-32-9, 4-Fluorotoluene  
352-70-5, 3-Fluorotoluene 462-06-6, Benzene,  
fluoro-  
RL: MOA (Modifier or additive use); USES (Uses)  
(polymer **electrolyte** for lithium secondary battery)  
RN 95-52-3 HCAPLUS  
CN Benzene, 1-fluoro-2-methyl- (9CI) (CA INDEX NAME)



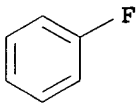
RN 352-32-9 HCAPLUS  
 CN Benzene, 1-fluoro-2-methyl- (9CI) (CA INDEX NAME)



RN 352-70-5 HCAPLUS  
 CN Benzene, 1-fluoro-3-methyl- (9CI) (CA INDEX NAME)



RN 462-06-6 HCAPLUS  
 CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40  
 ICS H01M010-04  
 INCL 429317000; 429307000; 429316000; 029623100  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 38  
 ST polymer **electrolyte** lithium secondary battery  
 IT Aromatic hydrocarbons, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (fluoro; polymer **electrolyte** for lithium secondary battery)  
 IT Secondary batteries  
 (lithium; polymer **electrolyte** for lithium secondary battery)  
 IT Battery **electrolytes**  
 Polymer **electrolytes**  
 (polymer **electrolyte** for lithium secondary battery)  
 IT Polyesters, uses  
 RL: DEV (Device component use); USES (Uses)  
 (polymer **electrolyte** for lithium secondary battery)  
 IT 3087-37-4, Tetrapropyltitanate  
 RL: CAT (Catalyst use); USES (Uses)

- (polymer **electrolyte** for lithium secondary battery)
- IT 94-36-0, Benzoyl peroxide, processes 105-74-8, Lauroyl peroxide  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
- (polymer **electrolyte** for lithium secondary battery)
- IT 67-68-5, DmsO, uses 68-12-2, Dmf, uses 75-05-8, Acetonitrile, uses 96-47-9, 2-Methyltetrahydrofuran 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 98-95-3, Nitrobenzene, uses 100-47-0, Benzonitrile, uses 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 108-90-7, Chlorobenzene, uses 109-99-9, Thf, uses 110-71-4, 1,2-Dimethoxyethane 111-46-6, Diethylene glycol, uses 115-10-6, Dimethyl **ether** 126-33-0, Sulfolane 127-19-5, Dimethylacetamide 542-52-9, Dibutyl carbonate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 623-96-1, Dipropyl carbonate 646-06-0, Dioxolane 872-36-6, Vinylene carbonate 1072-47-5, 1,3-Dioxolane, 4-methyl 1300-21-6, Dichloroethane 4437-85-8, Butylene carbonate 6482-34-4, Diisopropyl carbonate 7447-41-8, Lithium chloride (LiCl), uses 7791-03-9, Lithium perchlorate 9002-88-4, Polyethylene 9003-07-0, Polypropylene 10377-51-2, Lithium iodide (LiI) 14024-11-4, Aluminum lithium chloride  $\text{AlLiCl}_4$  14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 30714-78-4, Ethyl butyl carbonate 33454-82-9, Lithium triflate 51729-83-0, Methyl isopropyl carbonate 56525-42-9, Methyl propyl carbonate 90076-65-6 131651-65-5  
 RL: DEV (Device component use); USES (Uses)
- (polymer **electrolyte** for lithium secondary battery)
- IT 95-52-3, 2-Fluorotoluene 352-32-9, 4-Fluorotoluene 352-70-5, 3-Fluorotoluene 462-06-6, Benzene, fluoro- 581054-59-3D, mixed acrylic and pentanoic acid **esters**  
 RL: MOA (Modifier or additive use); USES (Uses)
- (polymer **electrolyte** for lithium secondary battery)

L56 ANSWER 23 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:282015 HCAPLUS

DOCUMENT NUMBER: 138:274139

TITLE: Nonaqueous **electrolyte** for lithium secondary battery

INVENTOR(S): Kim, Jin-Sung; Hwang, Sang-Moon; Shimizu, Ryuichi; Yamaguchi, Takitaro; Paik, Meen-Seon; Lee, Jin-Wook; Jung, Cheol-Soo

PATENT ASSIGNEE(S): Samsung Sdi Co., Ltd., S. Korea

SOURCE: U.S. Pat. Appl. Publ., 15 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 2003068562	A1	20030410	US 2002-119868	20020409
US 7008728	B2	20060307		

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JP 2002324577 A2 20021108 JP 2001-110350

200104  
09

KR 2002085969 A 20021118 KR 2001-25537

200105  
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PRIORITY APPLN. INFO.:

JP 2001-110350

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200104  
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KR 2001-25537

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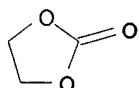
OTHER SOURCE(S): MARPAT 138:274139

AB An **electrolyte** for a lithium secondary battery is provided. The **electrolyte** includes a lithium salt, a non-aqueous organic **solvent**, and a compound represented by Formula R1(R2)C=C(R3)-CN : wherein R1, R2, and R3 are each independently selected from the group consisting of hydrogen, primary, secondary, and tertiary alkyl groups, alkenyl groups, and aryl groups. The compound of the present invention is decomposed earlier than an **electrolytic organic solvent**, and an organic SEI film is formed on a neg. electrode, thereby inhibiting the **electrolytic organic solvent** from decomposing

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 4437-85-8, Butylene carbonate  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. **electrolyte** for lithium secondary battery)

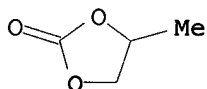
RN 96-49-1 HCAPLUS

CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



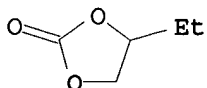
RN 108-32-7 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



RN 4437-85-8 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-ethyl- (9CI) (CA INDEX NAME)



IT 646-06-0, Dioxolane 1072-47-5, 1,3-Dioxolane,  
 4-Methyl

RL: MOA (Modifier or additive use); USES (Uses)  
 (nonaq. **electrolyte** for lithium secondary battery)

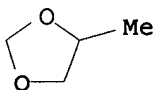
RN 646-06-0 HCAPLUS

CN 1,3-Dioxolane (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 1072-47-5 HCAPLUS

CN 1,3-Dioxolane, 4-methyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

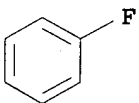


IT 462-06-6, Fluorobenzene 27359-10-0,  
 Trifluorotoluene

RL: TEM (Technical or engineered material use); USES (Uses)  
 (solvent; nonaq. **electrolyte** for lithium  
 secondary battery)

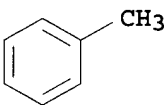
RN 462-06-6 HCAPLUS

CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 27359-10-0 HCAPLUS

CN Benzene, methyl-, trifluoro deriv. (9CI) (CA INDEX NAME)



3 ( D1- F )

IC ICM H01M010-40

INCL 429326000; X42-933.9; X42-933.0; X42-933.1; X42-933.2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq **electrolyte** lithium secondary battery

IT Secondary batteries

(lithium; nonaq. **electrolyte** for lithium secondary  
 battery)

IT Battery **electrolytes**

(nonaq. **electrolyte** for lithium secondary battery)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate

108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate

623-53-0, Methyl ethyl carbonate 623-96-1, Dipropyl carbonate  
 4437-85-8, Butylene carbonate 7439-93-2, Lithium, uses  
 7447-41-8, Lithium chloride, uses 7791-03-9, Lithium perchlorate  
 10377-51-2, Lithium iodide 12190-79-3, Cobalt lithium oxide colio2  
 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium  
 tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate  
 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium  
 hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7,  
 Ethyl propyl carbonate 56525-42-9, Methyl propyl carbonate  
 90076-65-6 131651-65-5, Lithium perfluorobutanesulfonate  
 RL: DEV (Device component use); USES (Uses)

(nonaq. electrolyte for lithium secondary battery)

IT 67-68-5, DmsO, uses 68-12-2, Dmf, uses 75-05-8, Acetonitrile,  
 uses 96-47-9, 2-Methyltetrahydrofuran 96-48-0,  
 γ-Butyrolactone 100-47-0, Benzonitrile, uses 107-13-1,  
 Acrylonitrile, uses 109-99-9, Thf, uses 110-71-4,  
 1,2-Dimethoxyethane 111-46-6, Diethylene glycol, uses 115-10-6,  
 Dimethyl ether 123-91-1, Dioxane, uses 126-33-0,  
 Sulfolane 126-98-7, Methacrylonitrile 127-19-5, Dimethyl  
 acetamide 646-06-0, Dioxolane 1072-47-5,  
 1,3-Dioxolane, 4-Methyl 1300-21-6, Dichloroethane 25721-76-0,  
 Polyethylene glycol dimethacrylate 26570-48-9, Polyethylene glycol  
 diacrylate 27236-41-5, Pentenenitrile 99839-14-2 503294-55-1  
 RL: MOA (Modifier or additive use); USES (Uses)

(nonaq. electrolyte for lithium secondary battery)

IT 71-43-2, Benzene, uses 108-88-3, Toluene, uses 462-06-6,  
 Fluorobenzene 1330-20-7, Xylene, uses 27359-10-0,  
 Trifluorotoluene

RL: TEM (Technical or engineered material use); USES (Uses)

(solvent; nonaq. electrolyte for lithium  
 secondary battery)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L56 ANSWER 24 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:638177 HCAPLUS

DOCUMENT NUMBER: 137:188207

TITLE: Polymer electrolytes for lithium  
 secondary battery with improved safety

INVENTOR(S): Lee, Yong-Boom; Jung, Chool-Soo; Lee, Kyoung-Hee

PATENT ASSIGNEE(S): Samsung Sdi Co., Ltd., S. Korea

SOURCE: U.S. Pat. Appl. Publ., 14 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 2002114997	A1	20020822	US 2002-36465	20020107
US 6833219	B2	20041221		
KR 2002057569	A	20020711	KR 2001-667	20010105

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CN 1384125 A 20021211 CN 2002-106465

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JP 2002289255 A2 20021004 JP 2002-877

200201  
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PRIORITY APPLN. INFO.:

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KR 2001-667

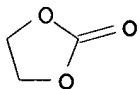
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200101  
05

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AB A polymer **electrolyte** for use in a lithium secondary battery prepared by polymerizing a composition including 0.1 to 90% by weight of a first compound represented by formula 1, a second compound represented by formula 2 or a mixture thereof, 0.1 to 90% by weight of a third compound represented by formula 3, and 9.8 to 99.8% by weight of a nonaq. organic solvent containing 0.5 to 2.0M of a lithium salt. Formula 1 is  $\text{CH(R1)=C(R2)-C(=O)O-R3-N(R4)(R5)}$ , formula 2 is  $\text{CH(R1)=C(R2)-C(=O)O-R3-CN}$ , and formula 3 is  $\text{Z-}\{-\text{Y-X-C(R2)=CH(R1)}\}_n$ .

IT 96-49-1, Ethylene carbonate 462-06-6,  
Fluorobenzene 27858-05-5, DiFluorobenzene  
RL: DEV (Device component use); USES (Uses)  
(polymer **electrolytes** for lithium secondary battery  
with improved safety)

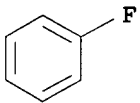
RN 96-49-1 HCAPLUS

CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



RN 462-06-6 HCAPLUS

CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 27858-05-5 HCAPLUS

CN Benzene, difluoro- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



2 (D1-F)

IC ICM H01M010-40

INCL 429314000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 38ST polymer **electrolyte** lithium secondary battery improved  
safety; safety lithium secondary battery polymer **electrolyte**IT Polymerization  
(electron beam-induced; polymer **electrolytes** for  
lithium secondary battery with improved safety)IT Polymer **electrolytes**  
(gel-type; polymer **electrolytes** for lithium secondary  
battery with improved safety)IT Secondary batteries  
(lithium; polymer **electrolytes** for lithium secondary  
battery with improved safety)IT **Esters**, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(peroxy; polymer **electrolytes** for lithium secondary  
battery with improved safety)IT Polymerization  
(photopolymer.; polymer **electrolytes** for lithium  
secondary battery with improved safety)IT Battery **electrolytes**  
Safety  
(polymer **electrolytes** for lithium secondary battery  
with improved safety)IT Carbon fibers, uses  
RL: DEV (Device component use); USES (Uses)  
(polymer **electrolytes** for lithium secondary battery  
with improved safety)IT Polymerization  
(thermal; polymer **electrolytes** for lithium secondary  
battery with improved safety)IT 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate  
105-58-8, Diethyl carbonate 112-49-2, Triglyme 143-24-8,  
Tetraglyme 462-06-6, Fluorobenzene 623-53-0, Ethyl  
methyl carbonate 872-36-6, Vinylene carbonate 7791-03-9, Lithium  
perchlorate 9002-88-4, Polyethylene 9003-07-0, Polypropylene  
12190-79-3, Cobalt lithium oxide colio2 14283-07-9, Lithium  
tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate  
27858-05-5, DiFluorobenzene 29935-35-1, Lithium  
hexafluoroarsenate 33454-82-9, Lithium triflate 90076-65-6  
449158-98-9 449158-99-0 449159-00-6 449159-01-7RL: DEV (Device component use); USES (Uses)  
(polymer **electrolytes** for lithium secondary battery  
with improved safety)IT 78-67-1, Azobisisobutyronitrile 94-36-0, Benzoyl peroxide, uses  
105-74-8, Lauroyl peroxide 110-22-5, Diacetyl peroxide 119-61-9,  
Benzophenone, uses 2094-98-6 2372-21-6, tert-Butyl peroxy  
isopropyl carbonate 4419-11-8 4511-39-1, tert-Amyl  
peroxybenzoate 34443-12-4, tert-Butyl peroxy 2-ethylhexyl  
carbonateRL: MOA (Modifier or additive use); USES (Uses)  
(polymer **electrolytes** for lithium secondary battery  
with improved safety)REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMATL56 ANSWER 25 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN  
ACCESSION NUMBER: 2002:84081 HCAPLUS

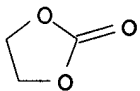
DOCUMENT NUMBER: 136:137403  
 TITLE: **Electrolyte** for a lithium-sulfur battery  
 INVENTOR(S): Hwang, Duckchul; Choi, Yunsuk; Choi, Sooseok; Lee, Jeawoan; Jung, Yongju; Kim, Joosoak  
 PATENT ASSIGNEE(S): Samsung SDI Co. Ltd., S. Korea  
 SOURCE: Eur. Pat. Appl., 7 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1176659	A2	20020130	EP 2001-117661	20010725
EP 1176659	A3	20060531		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
KR 2002008704	A	20020131	KR 2000-42736	20000725
KR 2002008705	A	20020131	KR 2000-42737	20000725
JP 2002075447	A2	20020315	JP 2001-213435	20010713
US 2002102466	A1	20020801	US 2001-910952	20010724
CN 1335653	A	20020213	CN 2001-132526	20010725
PRIORITY APPLN. INFO.:				
			KR 2000-42736	A 20000725
			KR 2000-42737	A 20000725
AB An <b>electrolyte</b> for a lithium-sulfur battery has a <b>solvent</b> having a dielec. constant that is greater than or equal to 20, a <b>solvent</b> having a viscosity that is less than or equal to 1.3, and an <b>electrolyte</b> salt. This battery shows excellent capacity and cycle life characteristics.				
IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 462-06-6, Fluorobenzene 646-06-0, 1,3-Dioxolane 3741-38-6, Ethylene sulfite 25496-08-6, Fluorotoluene				

RL: DEV (Device component use); USES (Uses)  
(electrolyte for lithium-sulfur battery)

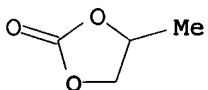
RN 96-49-1 HCAPLUS

CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



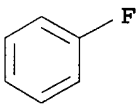
RN 108-32-7 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



RN 462-06-6 HCAPLUS

CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



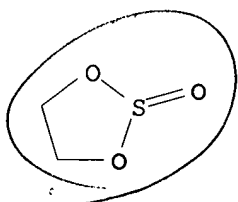
RN 646-06-0 HCAPLUS

CN 1,3-Dioxolane (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 3741-38-6 HCAPLUS

CN 1,3,2-Dioxathiolane, 2-oxide (9CI) (CA INDEX NAME)



RN 25496-08-6 HCAPLUS

CN Benzene, fluoromethyl- (9CI) (CA INDEX NAME)



D1- F

D1- Me

IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST **electrolyte** lithium sulfur battery  
 IT Battery **electrolytes**  
     (**electrolyte** for lithium-sulfur battery)  
 IT Secondary batteries  
     (lithium; **electrolyte** for lithium-sulfur battery)  
 IT 60-29-7, Ethyl **ether**, uses 64-17-5, Ethanol, uses  
 67-56-1, Methanol, uses 67-63-0, Isopropanol, uses 67-68-5,  
 DmsO, uses 68-12-2, Dmf, uses 71-43-2, Benzene, uses 75-05-8,  
 Acetonitrile, uses 78-93-3, Methylene **ketone**, uses  
 79-20-9, Methyl acetate 96-47-9, 2-Methyltetrahydrofuran  
 96-48-0,  $\gamma$ -Butyrolactone **96-49-1**, Ethylene carbonate  
 105-37-3, Ethyl propionate 105-58-8, Diethyl carbonate 107-31-3,  
 Methyl formate **108-32-7**, Propylene carbonate 109-60-4,  
 n-Propyl acetate 109-99-9, Thf, uses 110-71-4,  
 1,2-Dimethoxyethane 110-82-7, Cyclohexane, uses 110-86-1,  
 Pyridine, uses 111-96-6, Diglyme 123-91-1, p-Dioxane, uses  
 126-33-0, Sulfolane 141-78-6, Ethyl acetate, uses 420-12-2,  
 Ethylene sulfide **462-06-6**, Fluorobenzene 554-12-1,  
 Methyl propionate 616-38-6, Dimethyl carbonate 623-53-0,  
 Ethylmethyl carbonate **646-06-0**, 1,3-Dioxolane 680-31-9,  
 Hexamethylphosphoramide, uses 822-38-8, Ethylene trithiocarbonate  
 872-36-6, Vinylene carbonate 930-35-8, Vinylene trithiocarbonate  
**3741-38-6**, Ethylene sulfite 7704-34-9, Sulfur, uses  
 7791-03-9, Lithium perchlorate 14283-07-9, Lithium  
 tetrafluoroborate 16508-95-5, Bismuth carbonate 21324-40-3,  
 Lithium hexafluorophosphate **25496-08-6**, Fluorotoluene  
 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium  
 triflate 74432-42-1, Lithium polysulfide 90076-65-6  
 RL: DEV (Device component use); USES (Uses)  
     (**electrolyte** for lithium-sulfur battery)

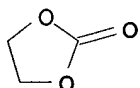
L56 ANSWER 26 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2001:692247 HCAPLUS  
 DOCUMENT NUMBER: 135:229393  
 TITLE: Organic **electrolyte** solutions and  
         secondary lithium batteries using the solutions  
 INVENTOR(S): Hwang, Duk Chul; Kim, Ki Kyug; Kang, Seung Gyun;  
               Lee, Se Wan; Lee, Yong Beum; Han, Se Jong; Lee,  
               In Sung  
 PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea  
 SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.  
         CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

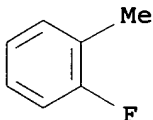
## PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001256996	A2	20010921	JP 2001-13042	20010122
KR 2001086991	A	20010915	KR 2000-11041	20000306
US 2001024757	A1	20010927	US 2001-768298	20010125
US 6497980	B2	20021224	KR 2000-11041	20000306

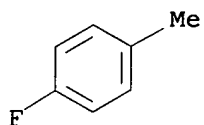
PRIORITY APPLN. INFO.:  
 AB The **electrolyte** solns. contain a Li salt and an organic **solvent** mixture containing ethylene carbonate 20-60, dialkyl carbonate 20-70, and fluorotoluene 5-30 volume%.  
 IT 96-49-1, Ethylene carbonate  
 RL: DEV (Device component use); USES (Uses)  
 (solvent mixts. containing carbonate **esters** and fluorotoluene for secondary lithium battery **electrolytes**)  
 RN 96-49-1 HCAPLUS  
 CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



IT 95-52-3, 2-Fluorotoluene 352-32-9, 4-Fluorotoluene  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (solvent mixts. containing carbonate **esters** and fluorotoluene for secondary lithium battery **electrolytes**)  
 RN 95-52-3 HCAPLUS  
 CN Benzene, 1-fluoro-2-methyl- (9CI) (CA INDEX NAME)



RN 352-32-9 HCAPLUS  
 CN Benzene, 1-fluoro-4-methyl- (9CI) (CA INDEX NAME)



IC H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST secondary lithium battery **electrolyte** carbonate  
**ester** fluorotoluene  
 IT Battery **electrolytes**  
     (solvent mixts. containing carbonate **esters** and  
     fluorotoluene for secondary lithium battery **electrolytes**  
     )  
 IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
 616-38-6, Dimethyl carbonate 21324-40-3, Lithium  
 hexafluorophosphate  
 RL: DEV (Device component use); USES (Uses)  
     (solvent mixts. containing carbonate **esters** and  
     fluorotoluene for secondary lithium battery **electrolytes**  
     )  
 IT 95-52-3, 2-Fluorotoluene 352-32-9, 4-Fluorotoluene  
 RL: MOA (Modifier or additive use); USES (Uses)  
     (solvent mixts. containing carbonate **esters** and  
     fluorotoluene for secondary lithium battery **electrolytes**  
     )

L56 ANSWER 27 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2001:377210 HCAPLUS

DOCUMENT NUMBER: 134:369424

TITLE: **Electrolyte** solutions for batteries  
 and capacitors

INVENTOR(S): Tsujioka, Shoichi; Takase, Hiroshige; Takahashi,  
 Mikihiro

PATENT ASSIGNEE(S): Central Glass Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

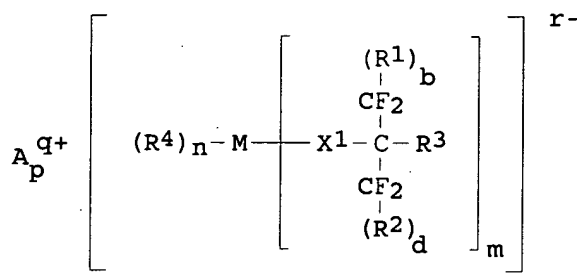
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001143750	A2	20010525	JP 1999-323490	199911 15
JP 3463926	B2	20031105	JP 1999-323490	199911 15

PRIORITY APPLN. INFO.: <--

OTHER SOURCE(S): MARPAT 134:369424  
 GI



AB The electrolyte solns. contain a complex electrolyte, having C-F bonding containing ligand in its anion, dissolved in a F containing organic solvent. The complex is preferably I, where Aq+ = metal ion or onium ion; M = transition metal or Group III-V element; a = 0-3, c = 0-3, (a+b) = 3 and (d+e) = 3 when a or c > 0; p = r/q, q = 1-3, r = 1-3; m = 0-8, n = 0-8; X1 = O, S, NR5, or NR5R6; R1 and R2 = H, halogen, or C1-10 (halogenated) alkyl; R3 = C1-10 (halogenated) alkyl or C4-20 (halogenated) aryl; R4 = halogen, C1-10 (halogenated) alkyl, C4-20 (halogenated) aryl, or X2R7; X2 = O, S, NR5, or NR5R6; R5 and R6 = H or C1-10 alkyl; and R7 = C1-10 (halogenated) alkyl or C4-20 (halogenated) aryl. M is preferably Al, B, V, Ti, Si, Zr, Ge, Sn, Cu, Y, Zn, Ga, Nb, Ta, Bi, P, As, Sc, Hf, or Sb; and Aq+ is Li+ or quaternary ammonium ion.

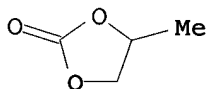
IT 108-32-7, Propylene carbonate 392-56-3,  
Hexafluorobenzene 1765-26-0, 2,2-Bis(trifluoromethyl)-1,3-dioxolane

RL: DEV (Device component use); USES (Uses)

(electrolyte solns. containing lithium salts with C-F bonding containing anion in fluoro organic solvents for batteries and capacitors)

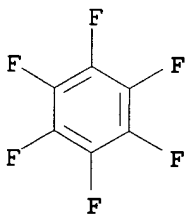
RN 108-32-7 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



RN 392-56-3 HCAPLUS

CN Benzene, hexafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 1765-26-0 HCAPLUS

CN 1,3-Dioxolane, 2,2-bis(trifluoromethyl)- (6CI, 7CI, 8CI, 9CI) (CA



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JP 3557959	B2	20040825			
JP 2001072876	A2	20010321	JP 1999-248888		199909
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JP 3557960	B2	20040825			
JP 2001072877	A2	20010321	JP 1999-248889		199909
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JP 3557961	B2	20040825			
JP 2001131246	A2	20010515	JP 1999-318000		199911
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CA 2344204	AA	20010315	CA 2000-2344204		200008
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EP 1160268	A1	20011205	EP 2000-955080		200008
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EP 1160268	B1	20040804			
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,					
PT, IE, FI					
EP 1428849	A1	20040616	EP 2004-2946		200008
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EP 1428849	B1	20060405			
R: DE, FR, IT					
EP 1428850	A1	20040616	EP 2004-2947		200008
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EP 1428850	B1	20050504			
R: DE, FR, IT					
US 2004202912	A1	20041014	US 2004-835816		200404
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US 7045242	B2	20060516			
PRIORITY APPLN. INFO.:			JP 1999-248887	A	199909
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			JP 1999-248888	A	199909
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			JP 1999-248889	A	199909
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			JP 1999-318000	A	199911
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EP 2000-955080	A3	200008
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WO 2000-JP5811	W	200008
		28

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US 2001-787233	B1	200104
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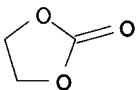
AB The polymers are of the following types: (1) a dendrimer-like polymer having trivalent B atom at core and wedge point, a heteroatom such as O as linking unit (L), and di- to hexavalent group with mol. weight of  $\geq 150$  linking to the B atom via L, (2) a compound obtained by crosslinking of a multiarm polymer of B(XRY)<sub>3</sub> type [X = heteroatom; R = divalent group having mol. weight of  $> 150$  (e.g., polyoxyethylene group); Y = polymerizable functional group], (3) a high-mol. compound bearing B atom preferably on side chain end or main chain end, and (4) high-mol. compound containing tetravalent B. The polymer **electrolytes** with improved charge-carrying ion capacities are obtained by mixing one or more types of the polymers above with an **electrolyte** salt such as a lithium salt and an aprotic **solvent**, e.g., carbonates, lactones, **ether**, etc., and can be used in batteries or capacitors. Thus, coupling a diol derived from ethylene oxide ring opening reaction with borane gave a 3-arm polymer, 1 g of which was combined with LiBF<sub>4</sub> at 1 mol/kg and 2.3 g  $\gamma$ -butyrolactone and cast coated on a glass surface to give a film of polymer **electrolyte**.

IT 96-49-1, Ethylene carbonate 646-06-0,  
1,3-Dioxolane

RL: NUU (Other use, unclassified); USES (Uses)  
(aprotic **solvent**; manufacture of B-containing ionically  
conductive polymers useful for polymeric **electrolytes**  
and elec. devices)

RN 96-49-1 HCAPLUS

CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



RN 646-06-0 HCAPLUS

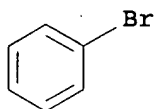
CN 1,3-Dioxolane (6CI, 8CI, 9CI) (CA INDEX NAME)



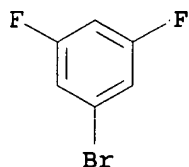
IT 108-86-1DP, Bromobenzene, reaction products with borane and monoalkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing 461-96-1DP, 3,5-Difluorobromobenzene, reaction products with borane and monoalkenyl-terminated

polyoxyalkylenes, lithium complexes, anion-containing  
 RL: DEV (Device component use); IMF (Industrial manufacture); POF  
 (Polymer in formulation); PRP (Properties); TEM (Technical or  
 engineered material use); PREP (Preparation); USES (Uses)  
 (manufacture of B-containing ionically conductive polymers useful for  
 polymeric **electrolytes** and elec. devices)

RN 108-86-1 HCAPLUS  
 CN Benzene, bromo- (8CI, 9CI) (CA INDEX NAME)



RN 461-96-1 HCAPLUS  
 CN Benzene, 1-bromo-3,5-difluoro- (8CI, 9CI) (CA INDEX NAME)



IC ICM C08G079-08  
 ICS H01B001-06; H01M006-18; H01M010-40  
 CC 35-7 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 52, 76  
 ST boron core dendrimer like conductive polymer **electrolyte**;  
 aprotic **solvent** polymer **electrolyte** boron contg  
 polymer; battery manuf polymer **electrolyte** boron contg  
 polymer; capacitor manuf polymer **electrolyte** boron contg  
 polymer; polyoxyethylene borane adduct multiarm polymer  
**electrolyte**; star block borane polyoxyethylene adduct  
 polymer **electrolyte**; starburst borane polyoxyethylene  
 adduct polymer **electrolyte**  
 IT Polyoxyalkylenes, preparation  
 RL: DEV (Device component use); IMF (Industrial manufacture); POF  
 (Polymer in formulation); PRP (Properties); TEM (Technical or  
 engineered material use); PREP (Preparation); USES (Uses)  
 (acrylic, boron-containing multiarm or dendritic, crosslinked; manufacture  
 of B-containing ionically conductive polymers useful for polymeric  
**electrolytes** and elec. devices)  
 IT Polyoxyalkylenes, preparation  
 RL: DEV (Device component use); IMF (Industrial manufacture); POF  
 (Polymer in formulation); PRP (Properties); TEM (Technical or  
 engineered material use); PREP (Preparation); USES (Uses)  
 (boron-containing multiarm or dendritic, crosslinked; manufacture of  
 B-containing ionically conductive polymers useful for polymeric  
**electrolytes** and elec. devices)  
 IT Capacitors  
 Secondary batteries  
 (lithium ion; manufacture of B-containing ionically conductive polymers  
 useful for polymeric **electrolytes** and elec. devices)  
 IT Conducting polymers  
 Polymer **electrolytes**

- (manufacture of B-containing ionically conductive polymers useful for polymeric **electrolytes** and elec. devices)
- IT Dendritic polymers  
 RL: DEV (Device component use); IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (manufacture of B-containing ionically conductive polymers useful for polymeric **electrolytes** and elec. devices)
- IT Boranes  
 RL: DEV (Device component use); IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (reaction products with monoalkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing; manufacture of B-containing ionically conductive polymers useful for polymeric **electrolytes** and elec. devices)
- IT 329687-70-9DP, lithium complexes, anion-containing  
 RL: DEV (Device component use); IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (3-arm; manufacture of B-containing ionically conductive polymers useful for polymeric **electrolytes** and elec. devices)
- IT 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7789-24-4, Lithium fluoride, uses 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide 14283-07-9, Lithium tetrafluoroborate (LiBF<sub>4</sub>) 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6 132404-42-3 132843-44-8  
 RL: DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)  
 (B-containing multiarm or dendritic polyoxyalkylene polymer complexes; manufacture of B-containing ionically conductive polymers useful for polymeric **electrolytes** and elec. devices)
- IT 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 110-71-4, 1,2-Dimethoxyethane 126-33-0, Sulfolane 646-06-0, 1,3-Dioxolane  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (aprotic **solvent**; manufacture of B-containing ionically conductive polymers useful for polymeric **electrolytes** and elec. devices)
- IT 329352-15-0DP, lithium complexes, anion-containing  
 RL: DEV (Device component use); IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (comb, dendritic; manufacture of B-containing ionically conductive polymers useful for polymeric **electrolytes** and elec. devices)
- IT 329352-19-4DP, lithium complexes, bromate- or chlorate-containing 329352-20-7DP, lithium complexes, hexafluoroarsenate-containing 329352-21-8DP, lithium complexes, anion-containing  
 RL: DEV (Device component use); IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (dendritic, from divergent approach; manufacture of B-containing ionically conductive polymers useful for polymeric **electrolytes** and elec. devices)
- IT 329352-16-1DP, lithium complexes, anion-containing 329352-17-2DP, lithium complexes, anion-containing 329352-18-3DP, lithium complexes, anion-containing 329352-22-9DP, lithium complexes, tetrafluoroborate-containing 329352-23-0DP, lithium complexes,

hexafluorophosphate-containing

RL: DEV (Device component use); IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(dendritic; manufacture of B-containing ionically conductive polymers useful for polymeric **electrolytes** and elec. devices)

- IT 67-56-1DP, Methanol, reaction products with borane and monoalkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing, preparation 100-02-7DP, p-Nitrophenol, reaction products with borane and monoalkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing 108-86-1DP, Bromobenzene, reaction products with borane and monoalkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing 108-95-2DP, Phenol, reaction products with borane and monoalkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing, preparation 109-86-4DP, Ethylene glycol monomethyl **ether**, boron derives., lithium complexes, anion-containing 111-87-5DP, Octanol, reaction products with borane and monoalkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing 120-80-9DP, Catechol, reaction products with borane and monoalkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing 461-96-1DP, 3,5-Difluorobromobenzene, reaction products with borane and monoalkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing 518-05-8DP, 1,8-Naphthalenedicarboxylic acid, reaction products with borane and monoalkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing 1806-29-7DP, Biphenyl-2,2'-diol, reaction products with borane and monoalkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing 26570-48-9DP, Polyethylene glycol diacrylate, polymer with boron-containing alkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing 50986-11-3DP, polymer with boron-containing alkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing 77716-60-0DP, Polyethylene glycol monovinyl **ether**, boron derives., lithium complexes, anion-containing 328312-85-2DP, polymer with boron-containing alkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing 329687-75-4DP, polymer with boron-containing alkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing 329687-76-5DP, polymer with boron-containing alkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing 329687-77-6DP, polymer with boron-containing alkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing 329687-79-8DP, polymer with boron-containing alkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing 329687-80-1DP, polymer with boron-containing alkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing 329688-10-0DP, boron derives., lithium complexes, anion-containing 329688-12-2DP, polymer with boron-containing alkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing 329688-13-3DP, polymer with boron-containing alkenyl-terminated polyoxyalkylenes, lithium complexes, anion-containing
- RL: DEV (Device component use); IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
- (manufacture of B-containing ionically conductive polymers useful for polymeric **electrolytes** and elec. devices)
- IT 75-89-8DP, reaction products with borane and monoalkenyl-terminated polyoxyalkylenes, lithium salts 141-82-2DP, Malonic acid, reaction products with borane and monoalkenyl-terminated polyoxyalkylenes, lithium salts 771-61-9DP, reaction products with borane and monoalkenyl-terminated polyoxyalkylenes, lithium salts 920-66-1DP, reaction products with borane and monoalkenyl-terminated

polyoxyalkylenes, lithium salts 2378-02-1DP, reaction products with borane and monoalkenyl-terminated polyoxyalkylenes, lithium salts 329358-74-9P 329358-75-0P 329358-76-1P 329687-86-7DP, boron derives., lithium containing 329688-14-4P 329688-15-5P  
 RL: DEV (Device component use); IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(manufacture of B-containing ionically conductive polymers useful for polymeric **electrolytes** and elec. devices)

IT 9051-31-4D, Polyethylene glycol monoacrylate homopolymer, lithium complexes, anion-containing  
 RL: DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(multiarm; manufacture of B-containing ionically conductive polymers useful for polymeric **electrolytes** and elec. devices)

IT 26403-58-7DP, Polyethylene glycol monoacrylate, boron derives., lithium complexes, anion-containing 39420-45-6DP, Polypropylene glycol monomethacrylate, boron derives., lithium complexes, anion-containing 329687-72-1DP, boron derives., lithium complexes, anion-containing 329687-74-3DP, boron derives., lithium complexes, anion-containing  
 RL: DEV (Device component use); IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(optionally 3-arm; manufacture of B-containing ionically conductive polymers useful for polymeric **electrolytes** and elec. devices)

IT 329687-81-2DP, boron derives., lithium containing 329687-82-3DP, boron derives., lithium containing 329687-83-4DP, boron derives., lithium containing 329688-16-6DP, boron derives., lithium containing  
 RL: DEV (Device component use); IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(optionally 3-arm; manufacture of B-containing ionically conductive polymers useful for polymeric **electrolytes** and elec. devices)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L56 ANSWER 29 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2001:31797 HCAPLUS

DOCUMENT NUMBER: 134:88833

TITLE: Nonaqueous **electrolyte** composition for batteries

INVENTOR(S): Kim, Jong Seob; Kim, Young Gyu; Chang, Tu Won; Kim, Kwang Sik; Kim, Jin Sung; Ahn, Ky Hoon

PATENT ASSIGNEE(S): Cheil Industries Inc., S. Korea; Samsung SDI Co., Ltd.

SOURCE: PCT Int. Appl., 16 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2001003229	A1	20010111	WO 1999-KR811	199912

24

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W: CN, JP, US

RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC,  
NL, PT, SE

KR 2001008488 A 20010205 KR 1999-26358

199907  
01

&lt;--

EP 1125338 A1 20010822 EP 1999-963685

199912  
24

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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
PT, IE, FI

JP 2003504812 T2 20030204 JP 2001-508534

199912  
24

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TW 461135 B 20011021 TW 2000-89103205

200002  
23

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US 6855458 B1 20050215 US 2001-786012

200102  
26

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PRIORITY APPLN. INFO.:

KR 1999-26358

A

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WO 1999-KR811

W

199912  
24

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OTHER SOURCE(S): MARPAT 134:88833

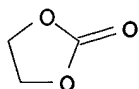
AB Disclosed is a nonaq. **electrolyte** composition for batteries, which is composed of a mixture of a fluorobenzene component and a carbonic acid **ester** component in which the volume ratio of the fluorobenzene component to the carbonic acid **ester** component ranges from 50:50 to 5:95. The nonaq. **electrolyte** composition has a significant advantage over **electrolyte** compns. employing carbonic acid **ester solvents** only, in terms of low temperature performance, cell life, and high-temperature dischargeability.

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 367-11-3, 1,2-DiFluorobenzene 367-23-7, 1,2,4-Trifluorobenzene 372-18-9, 1,3-DiFluorobenzene 462-06-6, Fluorobenzene 540-36-3, 1,4-DiFluorobenzene 4437-85-8, Butylene carbonate 27858-05-5, DiFluorobenzene

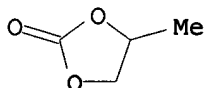
RL: DEV (Device component use); USES (Uses)  
(nonaq. **electrolyte** composition for lithium secondary batteries)

RN 96-49-1 HCAPLUS

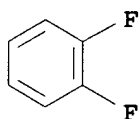
CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



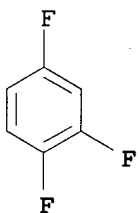
RN 108-32-7 HCAPLUS  
CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



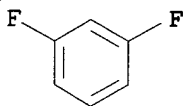
RN 367-11-3 HCAPLUS  
CN Benzene, 1,2-difluoro- (9CI) (CA INDEX NAME)



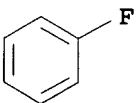
RN 367-23-7 HCAPLUS  
CN Benzene, 1,2,4-trifluoro- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 372-18-9 HCAPLUS  
CN Benzene, 1,3-difluoro- (9CI) (CA INDEX NAME)

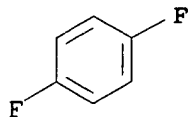


RN 462-06-6 HCAPLUS  
CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



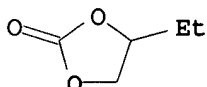
RN 540-36-3 HCAPLUS

CN Benzene, 1,4-difluoro- (9CI) (CA INDEX NAME)



RN 4437-85-8 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-ethyl- (9CI) (CA INDEX NAME)



RN 27858-05-5 HCAPLUS

CN Benzene, difluoro- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



2 ( D1- F )

IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST battery **electrolyte** fluorobenzene carbonic acid  
**ester**

IT Secondary batteries

(lithium; nonaq. **electrolyte** composition for lithium  
secondary batteries)

IT Battery **electrolytes**

(nonaq. **electrolyte** composition for lithium secondary  
batteries)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate

108-32-7, Propylene carbonate 367-11-3,

1,2-DiFluorobenzene 367-23-7, 1,2,4-Trifluorobenzene

372-18-9, 1,3-DiFluorobenzene 462-06-6,

Fluorobenzene 540-36-3, 1,4-DiFluorobenzene 616-38-6,

Dimethyl carbonate 623-53-0, Ethylmethyl carbonate 623-96-1,

Dipropyl carbonate 4437-85-8, Butylene carbonate

7791-03-9, Lithium perchlorate 14283-07-9, Lithium

tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate

27858-05-5, DiFluorobenzene 29935-35-1, Lithium

hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7,

Ethylpropyl carbonate 56525-42-9, Methylpropyl carbonate

RL: DEV (Device component use); USES (Uses)

(nonaq. **electrolyte** composition for lithium secondary  
batteries)

REFERENCE COUNT:

2

THERE ARE 2 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN  
THE RE FORMAT

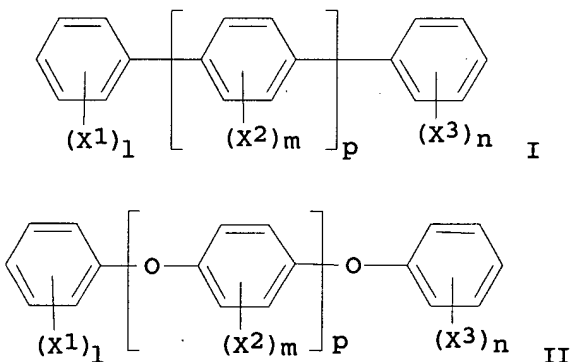
L56 ANSWER 30 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2000:739739 HCAPLUS  
 DOCUMENT NUMBER: 133:323949  
 TITLE: Nonaqueous **electrolyte** solutions and  
 secondary nonaqueous **electrolyte**  
 batteries  
 INVENTOR(S): Hayashi, Takeshi  
 PATENT ASSIGNEE(S): Mitsui Chemical Industry Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000294279	A2	20001020	JP 1999-95968	19990402

PRIORITY APPLN. INFO.:

JP 1999-95968

19990402

OTHER SOURCE(S): MARPAT 133:323949  
GI

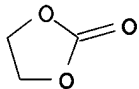
AB The **electrolyte** solns. have an **electrolyte** and a nonaq. **solvent** containing aromatic compds. I or II, where X1-3 = F, Cl, ROCO-, RCO2-, or ROCO2- groups (R = C1-10 hydrocarbon group which may contain oxy group), l and n = 0-5 integer, m = 0-4 integer, l+m+n ≤ 14, and p = 0-5 integer. The **solvent** may also contain cyclic carbonate **esters**, e.g., ethylene carbonate and vinylene carbonate which may have C1-10 alkyl group and F, Cl, or Br substituents on the alkyl group, and linear C1-10 dialkyl carbonate **esters** which may have F, Cl, or Br substituents on the C1-10 alkyl groups. The batteries are secondary Li batteries.

IT 96-49-1, Ethylene carbonate  
 RL: DEV (Device component use); USES (Uses)

(nonaq. electrolyte solns. containing aromatic compds. for  
secondary lithium batteries)

RN 96-49-1 HCAPLUS

CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



IT 321-60-8, 2-Fluorobiphenyl 324-74-3,

4-Fluorobiphenyl 398-22-1 398-23-2,

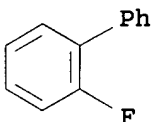
4,4'-Difluorobiphenyl 2051-62-9, 4-Chlorobiphenyl

RL: MOA (Modifier or additive use); USES (Uses)

(nonaq. electrolyte solns. containing aromatic compds. for  
secondary lithium batteries)

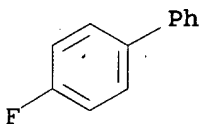
RN 321-60-8 HCAPLUS

CN 1,1'-Biphenyl, 2-fluoro- (9CI) (CA INDEX NAME)



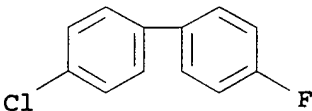
RN 324-74-3 HCAPLUS

CN 1,1'-Biphenyl, 4-fluoro- (9CI) (CA INDEX NAME)



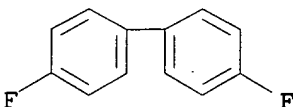
RN 398-22-1 HCAPLUS

CN 1,1'-Biphenyl, 4-chloro-4'-fluoro- (9CI) (CA INDEX NAME)



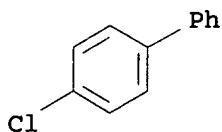
RN 398-23-2 HCAPLUS

CN 1,1'-Biphenyl, 4,4'-difluoro- (9CI) (CA INDEX NAME)



RN 2051-62-9 HCAPLUS

CN 1,1'-Biphenyl, 4-chloro- (9CI) (CA INDEX NAME)



IC ICM H01M010-40  
ICS H01M004-48; H01M004-58  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST secondary lithium battery **electrolyte solvent**  
arom compd  
IT **Battery electrolytes**  
(nonaq. **electrolyte** solns. containing aromatic compds. for  
secondary lithium batteries)  
IT **96-49-1**, Ethylene carbonate 616-38-6, Dimethyl carbonate  
21324-40-3, Lithium hexafluorophosphate  
RL: DEV (Device component use); USES (Uses)  
(nonaq. **electrolyte** solns. containing aromatic compds. for  
secondary lithium batteries)  
IT **321-60-8**, 2-Fluorobiphenyl **324-74-3**,  
4-Fluorobiphenyl 330-84-7, 4-Fluorophenyl phenyl **ether**  
330-93-8 **398-22-1** **398-23-2**, 4,4'-  
Difluorobiphenyl 720-75-2, 4-Methoxycarbonylbiphenyl  
**2051-62-9**, 4-Chlorobiphenyl 7005-72-3, 4-Chlorophenyl  
phenyl **ether** 19082-52-1 21218-94-0 137739-26-5  
RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. **electrolyte** solns. containing aromatic compds. for  
secondary lithium batteries)

L56 ANSWER 31 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2000:551377 HCAPLUS

DOCUMENT NUMBER: 133:166219

TITLE: Nonaqueous **electrolyte** solutions and  
secondary nonaqueous-**electrolyte**  
batteries

INVENTOR(S): Hayashi, Takeshi; Tan, Hiroaki

PATENT ASSIGNEE(S): Mitsui Chemical Industry Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2000223150	A2	20000811	JP 1999-24268	199902 01

PRIORITY APPLN. INFO.: &lt;-- JP 1999-24268

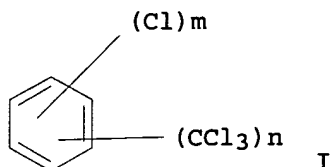
199902  
01

OTHER SOURCE(S): MARPAT 133:166219

MEI HUANG EIC1700 REM4B28 571-272-3952

18/12/2006

GI

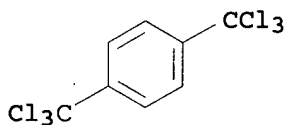


AB The aqueous **electrolyte** solns. are composed of an **electrolyte** and a nonaq. **solvent** containing chlorinated aromatic compds. I, where  $m=0-6$ ,  $n=0-3$ , and  $1 \leq (m+n) \leq 6$ . The **solvent** may also contain cyclic and/or linear carbonic **esters**, and the **electrolyte** is selected from  $\text{LiPF}_6$ ,  $\text{LiBF}_4$ , and organic Li salts  $\text{LiOSOR}_1$ ,  $\text{LiN}(\text{SO}_2\text{R}_2)(\text{SO}_2\text{R}_3)$ ,  $\text{LiC}(\text{SO}_2\text{R}_4)(\text{SO}_2\text{R}_5)(\text{SO}_2\text{R}_6)$ , and  $\text{LiN}(\text{SO}_2\text{OCH}_2\text{R}_7)(\text{SO}_2\text{OCH}_2\text{R}_8)$  ( $\text{R}_1-8=\text{C}_1-6$  fluoroalkyl groups). The batteries are Li batteries.

IT 68-36-0, 1,4-Bis(trichloromethyl)benzene 95-50-1, o-Dichlorobenzene 96-49-1, Ethylene carbonate 108-90-7, Chlorobenzene, uses 120-82-1, 1,2,4-Trichlorobenzene 881-99-2, 1,3-Bis(trichloromethyl)benzene 2136-89-2, 2-Chlorobenzotrichloride 60047-42-9  
 RL: DEV (Device component use); USES (Uses)  
 (in nonaq. **electrolyte** solns. for secondary lithium batteries)

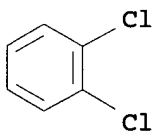
RN 68-36-0 HCAPLUS

CN Benzene, 1,4-bis(trichloromethyl)- (9CI) (CA INDEX NAME)



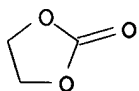
RN 95-50-1 HCAPLUS

CN Benzene, 1,2-dichloro- (9CI) (CA INDEX NAME)

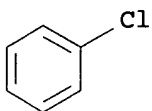


RN 96-49-1 HCAPLUS

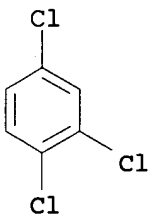
CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



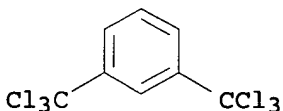
RN 108-90-7 HCAPLUS  
CN Benzene, chloro- (8CI, 9CI) (CA INDEX NAME)



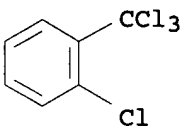
RN 120-82-1 HCAPLUS  
CN Benzene, 1,2,4-trichloro- (8CI, 9CI) (CA INDEX NAME)



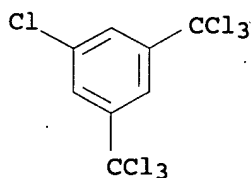
RN 881-99-2 HCAPLUS  
CN Benzene, 1,3-bis(trichloromethyl)- (9CI) (CA INDEX NAME)



RN 2136-89-2 HCAPLUS  
CN Benzene, 1-chloro-2-(trichloromethyl)- (9CI) (CA INDEX NAME)



RN 60047-42-9 HCAPLUS  
CN Benzene, 1-chloro-3,5-bis(trichloromethyl)- (9CI) (CA INDEX NAME)

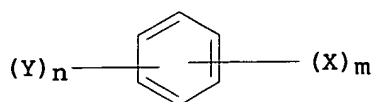


IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST secondary lithium battery nonaq electrolyte soln  
 IT Battery electrolytes  
 (nonaq. electrolyte solns. for secondary lithium batteries)  
 IT 68-36-0, 1,4-Bis(trichloromethyl)benzene 95-50-1,  
 o-Dichlorobenzene 96-49-1, Ethylene carbonate  
 108-90-7, Chlorobenzene, uses 120-82-1,  
 1,2,4-Trichlorobenzene 616-38-6, Dimethyl carbonate  
 881-99-2, 1,3-Bis(trichloromethyl)benzene 2136-89-2  
 , 2-Chlorobenzotrichloride 21324-40-3, Lithium hexafluorophosphate  
 60047-42-9  
 RL: DEV (Device component use); USES (Uses)  
 (in nonaq. electrolyte solns. for secondary lithium batteries)

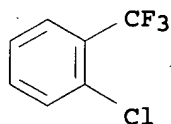
L56 ANSWER 32 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 2000:236228 HCAPLUS  
 DOCUMENT NUMBER: 132:267590  
 TITLE: Nonaqueous electrolyte in secondary battery  
 INVENTOR(S): Hayashi, Takeshi; Tan, Hiroaki  
 PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000106209	A2	20000411	JP 1998-278262	19980930
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PRIORITY APPLN. INFO.:			JP 1998-278262	19980930
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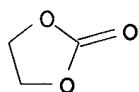
OTHER SOURCE(S): MARPAT 132:267590  
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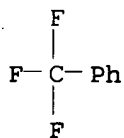
- AB The nonaq. **electrolyte** comprises nonaq. **solvent** having general formula I, where X is C1-10 hydrocarbon group or containing  $\geq 1$  atom selected from O; S; N; P, or Cl; Br; I, Y is F-containing C1-5 hydrocarbon group, n is 1-5, and m is 0-3 with  $m+n \leq 6$ , e.g., carboxylic acid **ester**, and **electrolyte** (e.g., LiPF<sub>6</sub>).
- IT 88-16-4 96-49-1, Ethylene carbonate  
98-08-8 402-31-3 433-19-2  
433-95-4  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(nonaq. **electrolyte** in secondary battery)
- RN 88-16-4 HCAPLUS
- CN Benzene, 1-chloro-2-(trifluoromethyl)- (9CI) (CA INDEX NAME)



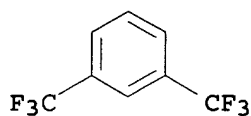
- RN 96-49-1 HCAPLUS
- CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



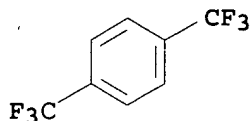
- RN 98-08-8 HCAPLUS
- CN Benzene, (trifluoromethyl)- (9CI) (CA INDEX NAME)



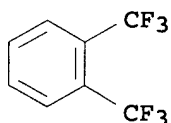
- RN 402-31-3 HCAPLUS
- CN Benzene, 1,3-bis(trifluoromethyl)- (9CI) (CA INDEX NAME)



RN 433-19-2 HCAPLUS  
 CN Benzene, 1,4-bis(trifluoromethyl)- (9CI) (CA INDEX NAME)



RN 433-95-4 HCAPLUS  
 CN Benzene, 1,2-bis(trifluoromethyl)- (9CI) (CA INDEX NAME)



IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 76  
 ST nonaq **electrolyte** secondary battery carbonate  
**ester**  
 IT Hydrocarbons, uses  
 RL: NUU (Other use, unclassified); PEP (Physical, engineering or  
 chemical process); PROC (Process); USES (Uses)  
 (fluorine-containing; nonaq. **electrolyte** in secondary  
 battery)  
 IT Battery **electrolytes**  
 Secondary batteries  
 (nonaq. **electrolyte** in secondary battery)  
 IT Aromatic hydrocarbons, uses  
 Carbonate **esters**  
 Carbonates, uses  
 RL: NUU (Other use, unclassified); PEP (Physical, engineering or  
 chemical process); PROC (Process); USES (Uses)  
 (nonaq. **electrolyte** in secondary battery)  
 IT **Solvents**  
 (nonaq.; nonaq. **electrolyte** in secondary battery)  
 IT 88-16-4 96-49-1, Ethylene carbonate  
 98-08-8 349-60-0 402-31-3 433-19-2  
 433-95-4 616-38-6, Dimethyl carbonate 42452-42-6  
 54644-50-7 108864-09-1  
 RL: NUU (Other use, unclassified); PEP (Physical, engineering or  
 chemical process); PROC (Process); USES (Uses)  
 (nonaq. **electrolyte** in secondary battery)

L56 ANSWER 33 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN  
 ACCESSION NUMBER: 1999:756821 HCAPLUS

DOCUMENT NUMBER: 131:353712  
 TITLE: Nonaqueous **electrolyte** solutions and secondary nonaqueous **electrolyte** batteries  
 INVENTOR(S): Hayashi, Takeshi; Hinohara, Akio; Tan, Hiroaki  
 PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11329496	A2	19991130	JP 1999-66663	19990312

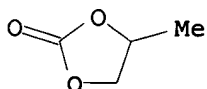
PRIORITY APPLN. INFO.: JP 1998-60951 A 19980312

OTHER SOURCE(S): MARPAT 131:353712

AB The **electrolyte** solns. contain an **electrolyte** and a nonaq. **solvent** mixture containing a F containing aromatic compound The aromatic compound is a C<sub>6</sub>H<sub>6</sub> derivative having 1-5 F atoms and 0-3 C<sub>1</sub>-10 hydrocarbon groups, which may contain O, S, N, P, and/or F; and the total number of F atom and the hydrocarbon group is ≤6. The **solvent** mixture also contain carbonate **esters**, and the **electrolyte** is selected from LiPF<sub>6</sub>, LiBF<sub>4</sub>, R<sub>3</sub>SO<sub>3</sub>Li, R<sub>2</sub>SO<sub>2</sub>N(R<sub>3</sub>SO<sub>2</sub>)Li, R<sub>4</sub>SO<sub>2</sub>C(R<sub>5</sub>SO<sub>2</sub>)(R<sub>6</sub>SO<sub>2</sub>)Li, and/or R<sub>7</sub>CH<sub>2</sub>O<sub>2</sub>SO<sub>2</sub>N(R<sub>8</sub>CH<sub>2</sub>O<sub>2</sub>SO<sub>2</sub>)Li, where R<sub>1</sub>-8 are C<sub>1</sub>-6 perfluoroalkyl groups. The batteries are secondary lithium batteries using Li, Li alloy, or Li intercalating anodes and Li transition metal oxide cathode.

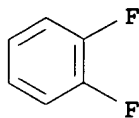
IT 108-32-7, Propylene carbonate  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte solns. containing fluoro aromatic compds. for secondary lithium batteries)

RN 108-32-7 HCAPLUS  
 CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)

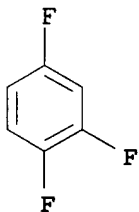


IT 367-11-3, o-Difluorobenzene 367-23-7, 1,2,4-Trifluorobenzene 372-18-9 402-44-8, p-Fluoro-trifluoromethylbenzene 462-06-6, Fluorobenzene  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (electrolyte solns. containing fluoro aromatic compds. for secondary lithium batteries)

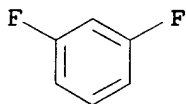
RN 367-11-3 HCAPLUS  
 CN Benzene, 1,2-difluoro- (9CI) (CA INDEX NAME)



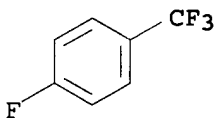
RN 367-23-7 HCAPLUS  
 CN Benzene, 1,2,4-trifluoro- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



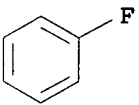
RN 372-18-9 HCAPLUS  
 CN Benzene, 1,3-difluoro- (9CI) (CA INDEX NAME)



RN 402-44-8 HCAPLUS  
 CN Benzene, 1-fluoro-4-(trifluoromethyl)- (9CI) (CA INDEX NAME)



RN 462-06-6 HCAPLUS  
 CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40  
 ICS H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST lithium battery **electrolyte** fluoro arom compd  
 IT Battery **electrolytes**  
     (**electrolyte** solns. containing fluoro aromatic compds. for  
     secondary lithium batteries)  
 IT 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate  
     21324-40-3, Lithium hexafluorophosphate

RL: DEV (Device component use); USES (Uses)

(**electrolyte** solns. containing fluoro aromatic compds. for secondary lithium batteries)

IT 367-11-3, o-Difluorobenzene 367-23-7,  
1,2,4-Trifluorobenzene 372-18-9 402-44-8,  
p-Fluoro-trifluoromethylbenzene 445-27-2 462-06-6,  
Fluorobenzene 701-83-7, 3-Fluorophenyl acetate 93343-10-3,  
3,5-Difluoroanisole

RL: MOA (Modifier or additive use); USES (Uses)

(**electrolyte** solns. containing fluoro aromatic compds. for secondary lithium batteries)

L56 ANSWER 34 OF 34 HCAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1997:101101 HCAPLUS

DOCUMENT NUMBER: 126:106587

TITLE: Nonaqueous **electrolyte** batteries  
having reactive additives in  
**electrolytes**

INVENTOR(S): Jinno, Maruo; Uehara, Mayumi; Sakurai, Atsushi;  
Nishio, Koji; Saito, Toshihiko

PATENT ASSIGNEE(S): Sanyo Denki Kk, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 08321313	A2	19961203	JP 1995-150845	199505 24

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PRIORITY APPLN. INFO.: JP 1995-150845

199505  
24

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AB In the batteries having cathodes, anodes using Li as an active mass, nonaq. **electrolytes** obtained by dissolving LiCF<sub>3</sub>SO<sub>3</sub> or LiPF<sub>6</sub> in **solvents** of ethylene carbonate, propylene carbonate, and/or butylene carbonate having high dielec. constant, and separators, the **electrolytes** contain 1-20% additives of tri-Me borate, tri-Et borate, di-Me Et boronate, Me Et borinate, Me<sub>3</sub>P, tri-Me phosphite, tri-Et phosphite, tri-Me phosphate, tri-Et phosphate, (MeO)<sub>4</sub>Ti, (EtO)<sub>4</sub>Ti, Al methoxide, Al ethoxide, CCl<sub>4</sub>, 1,2-dichloroethane, fluorobenzene, chloromethyl Et **ether**, 1,2-dichloroethyl Et **ether**, β-methoxyethoxymethyl chloride, 1,2-bis(2-chloroethoxy)ethane, 3-bromofuran, cetyltrimethylammonium chloride, 4-chloro-1,3-dioxolan-2-one, Mg(NO<sub>3</sub>)<sub>2</sub>, Fe(NO<sub>3</sub>)<sub>3</sub>, FeI<sub>3</sub>, Zn(NO<sub>3</sub>)<sub>2</sub>, ZnCO<sub>3</sub>, In(NO<sub>3</sub>)<sub>3</sub>, Ga(NO<sub>3</sub>)<sub>3</sub>, and/or HF. The **electrolytes** may contain 1,2-dimethoxyethane. Since the additives react with Li in anodes and the **solvents** and the solutes in the **electrolytes** to form coatings on the anodes for prevention of the reaction between the **electrolytes** and the anodes, the batteries have improved storage property.

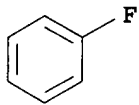
IT 462-06-6, Fluorobenzene 3967-54-2,  
4-Chloro-1,3-dioxolan-2-one

RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(electrolyte additive; nonaq. batteries having reactive additives in electrolytes for storage)

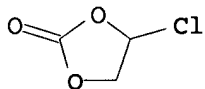
RN 462-06-6 HCAPLUS

CN Benzene, fluoro- (8CI, 9CI) (CA INDEX NAME)



RN 3967-54-2 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-chloro- (9CI) (CA INDEX NAME)



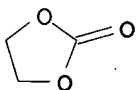
IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 4437-85-8, Butylene carbonate

RL: DEV (Device component use); USES (Uses)

(electrolyte solvent; nonaq. batteries having reactive additives in electrolytes for storage)

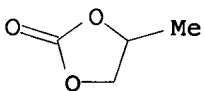
RN 96-49-1 HCAPLUS

CN 1,3-Dioxolan-2-one (9CI) (CA INDEX NAME)



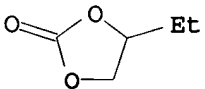
RN 108-32-7 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-methyl- (9CI) (CA INDEX NAME)



RN 4437-85-8 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-ethyl- (9CI) (CA INDEX NAME)



IC ICM H01M006-16

ICS H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq battery electrolyte reactive additive storage;  
lithium anode nonaq battery electrolyte additive

- IT Battery electrolytes  
(nonaq. batteries having reactive additives in electrolytes for storage)
- IT 7439-93-2, Lithium, uses  
RL: DEV (Device component use); USES (Uses)  
(anode active mass; nonaq. batteries having reactive additives in electrolytes for storage)
- IT 56-23-5, Carbon tetrachloride, uses 78-40-0, Triethyl phosphate  
107-06-2, 1,2-Dichloroethane, uses 112-02-7,  
Cetyltrimethylammonium chloride 112-26-5, 1,2-Bis(2-chloroethoxy)ethane 121-43-7, Trimethyl borate 121-45-9,  
Trimethyl phosphite 122-52-1, Triethyl phosphite 150-46-9,  
Triethyl borate 462-06-6, Fluorobenzene 512-56-1,  
Trimethyl phosphate 555-75-9, Aluminum ethoxide 594-09-2,  
Trimethylphosphine 623-46-1, 1,2-Dichloroethyl ethyl ether  
865-31-6, Aluminum methoxide 992-92-7, Tetramethylorthotitanate  
3087-36-3, Tetraethylorthotitanate 3188-13-4, Chloromethyl ethyl  
ether 3486-35-9, Zinc carbonate 3967-54-2,  
4-Chloro-1,3-dioxolan-2-one 3970-21-6,  $\beta$ -Methoxyethoxymethyl  
chloride 7318-82-3, Dimethyl ethyl boronate 7397-46-8, Methyl  
diethyl borinate 7664-39-3, Hydrofluoric acid, uses 7779-88-6,  
Zinc nitrate 10377-60-3, Magnesium nitrate 10421-48-4, Iron(III)  
nitrate 13494-90-1, Gallium nitrate 13770-61-1, Indium nitrate  
15600-49-4, Iron iodide (FeI<sub>3</sub>) 22037-28-1, 3-Bromofuran  
RL: DEV (Device component use); MOA (Modifier or additive use); USES  
(Uses)  
(electrolyte additive; nonaq. batteries having reactive  
additives in electrolytes for storage)
- IT 96-49-1, Ethylene carbonate 108-32-7, Propylene  
carbonate 110-71-4, 1,2-Dimethoxyethane 4437-85-8,  
Butylene carbonate  
RL: DEV (Device component use); USES (Uses)  
(electrolyte solvent; nonaq. batteries having  
reactive additives in electrolytes for storage)
- IT 21324-40-3, Lithium hexafluorophosphate 33454-82-9, Lithium  
trifluoromethanesulfonate  
RL: DEV (Device component use); USES (Uses)  
(electrolyte; nonaq. batteries having reactive  
additives in electrolytes for storage)

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